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No. 6375R

JVC Service Manual

THREE TUBE PROFESSIONAL COLOR VIDEO CAMERA

PROFFESSIONELLE DREIROHREN FARBVIDEO KAMERA

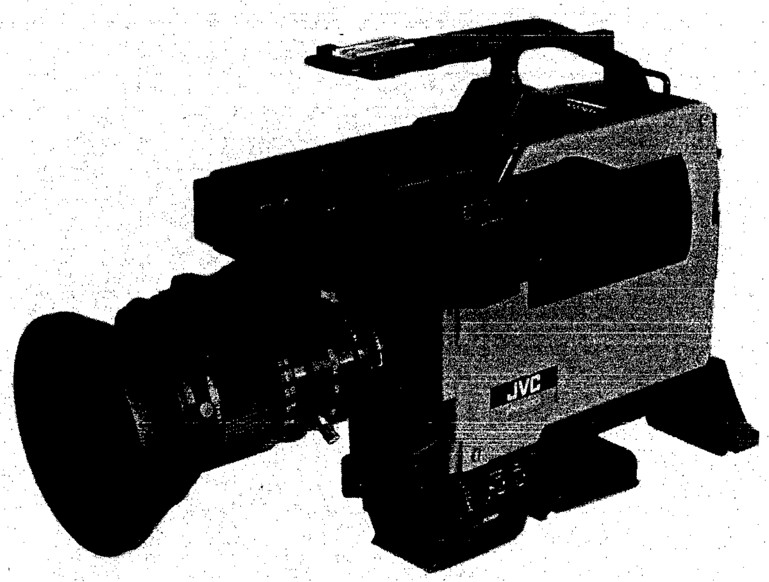
CAMERA COULEUR TRITUBES PROFESSIONNELLES

MODEL
MODELL
MODÈLE **KY-210**

VICTOR COMPANY OF JAPAN, LIMITED

No. 6375R

JVC Service Manual



MODEL KY-210

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors

5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

7. Check that replaced wires do not contact sharp edged or pointed parts.

8. When a power cord has been replaced, check that 10—15 kg of force in any direction will not loosen it.

9. Also check areas surrounding repaired locations.

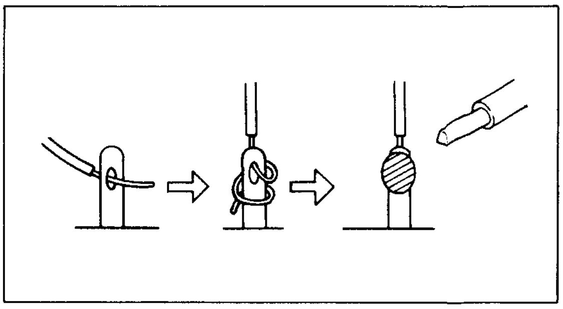


Fig. 1

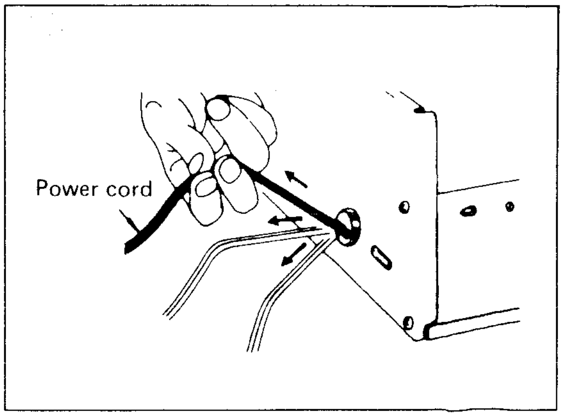


Fig. 2

10. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the parts specified. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

11. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1. Connector part number : E03830-001
2. Required tool : Connector crimping tool of the proper type which will not damage insulated parts.
3. Replacement procedure
   1) Remove the old connector by cutting the wires at a point close to the connector. Important : Do not reuse a connector (discard it).
   2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.
   3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.
   4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.
   5) Check the four points noted in Fig. 7.

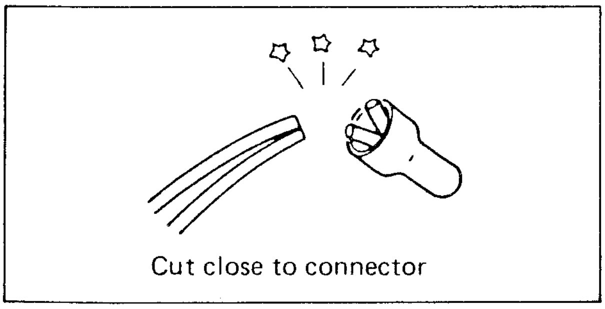

Cut close to connector

Fig. 3

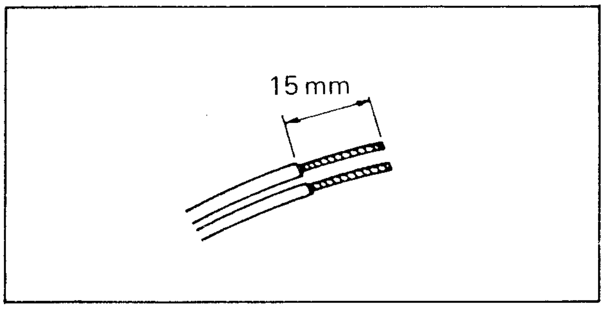


Fig. 4

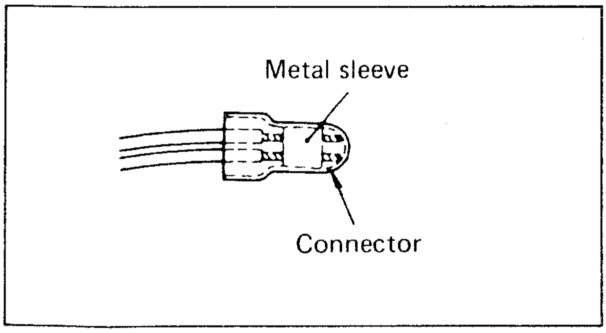

Metal sleeve
Connector

Fig. 5

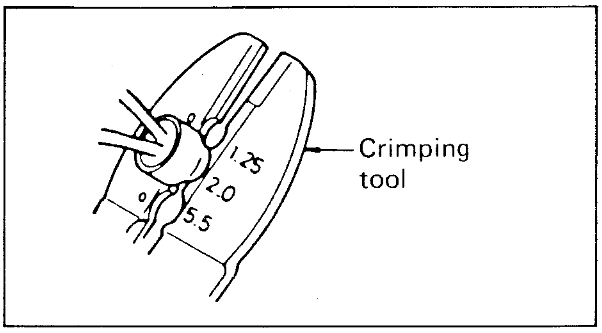

Crimping tool
1.25
2.0
5.5

Fig. 6

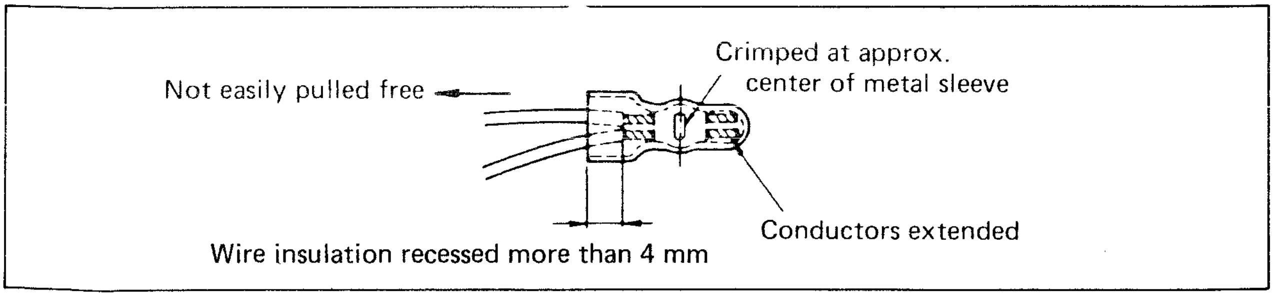

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) See table below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d),(d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

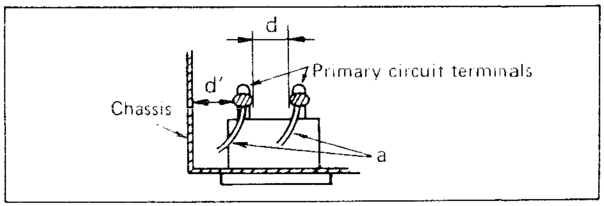


Fig. 8

Table 1: Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance(d),(d')
100 V	Japan	≧ 1 MΩ/500 V DC	1 kV 1 minute	≧ 3 mm
110 to 130 V	USA & Canada	– – –	900 V 1 minute	≧ 3.2 mm
* 110 to 130 V 200 to 240 V	Europe Australia	≧ 10 MΩ/500 V DC	2 kV 1 minute	≧ 4 mm (d) ≧ 8 mm (d') (a: Power cord)

* Class I model only.

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

4. **Leakage current test**
   Confirm specified or lower leakage current between B(earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

   Measuring Method: (Power ON)
   Insert load Z between B(earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

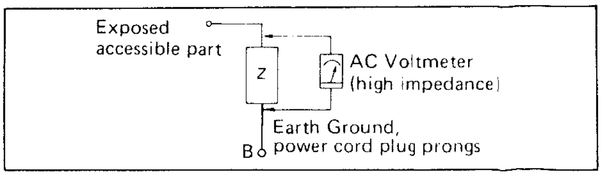

Exposed accessible part
Z
AC Voltmeter (high impedance)
Earth Ground, power cord plug prongs
B

Fig. 9

Table 2: Leakage current ratings for selected areas

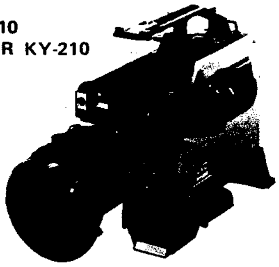
AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (B) to:
100 V	Japan	1 kΩ	i ≦ 1m A rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 µF 1.5 kΩ	i ≦ 0.5m A rms	Exposed accessible parts
110 to 130 V 200 to 240 V	Europe Australia	2 kΩ	i ≦ 0.7 m A peak i ≦ 2 m A dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 m A peak i ≦ 2 m A dc	Other terminals

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

JVC Instructions

THREE-TUBE COLOUR VIDEO CAMERA KY-210

BEDIENUNGSANLEITUNG: FARBVIDEOKAMERA KY-210
MANUEL D'INSTRUCTIONS: CAMERA VIDEO COULEUR KY-210



For Customer Use:
Enter below the Serial No. which is located on the top of the body. Retain this information for future reference.

Model No. KY-210

Serial No.

The instructions are given in three languages:
English from page 1 to 29
German from page 30 to 58
French from page 59 to 87

Bedienungsanleitung in drei Sprachen:
English: Seite 1 bis 29
Deutsch: Seite 30 bis 58
Franzosisch: Seite 59 bis 87

Les explications techniques sont données en trois langues:
Anglais, pages 1 à 29
Allemand, pages 30 à 58
Français, pages 59 à 87

Due to design modifications, data given in this instruction book are subject to possible change without prior notice.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

Protection of tube face:
The tube face will be damaged by strong rays of light, therefore, do not point the camera at the sun. Also, if the deflection circuit stops accidentally, quickly turn off the power switch and cap the lens to protect the tube face from possible damage.
When the camera is not in use, be sure to fit the cap and set the filter (⓭ on page 6) to position "1".

POWER SYSTEM

This colour video camera should be used with 12 V DC only.

CAUTION:

To prevent electric shocks and fire hazards, do NOT use other than specified power source.

Thank you for purchasing the JVC KY-210 Colour Video Camera. The KY-210 is a compact, sturdy unit designed especially for portability making it suitable for a wide range of applications in the field and in the studio. Productions can be shot in a variety of situations by using this camera in combination with a portable video recorder.
To gain maximum benefit from the camera, it is suggested that you study this booklet carefully. After reading, retain it for future reference.

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FEATURES

- **Low cost/high performance using the same design-philosophy as broadcast cameras**
  SPG conforming to PAL-B (with colour framing pulse output), H/V variable blanking circuits, genlock circuit.
- **Compact, light and rugged diecast construction for superior mobility and operability**
  Light weight of only 3.5 kg (7.8 lbs).
- **High picture quality with f/1.4 prism optical system and three Saticon* pickup tubes**
  High resolution of 650 lines, a video S/N of 54 dB and a minimum illumination of 40 lux (3.8 fc).
- **A wide range of automated functions for easier operation and calibration**
  Auto shift registration circuit, auto white balance circuit, auto black balance circuit, auto beam control (ABC) circuit, auto black level (ABL) circuit, NAM-type servo auto iris circuit, auto iris close circuit.

The genlock circuits require a stable input source; the KY-210 will not lock to a helical scan video recorder without a time-base corrector.

PRECAUTIONS

Safety Precautions

- Use only the optional DC-C50 or DC-C19 Battery Pack or the optional AA-C50 AC Power Adapter.
- Do not allow inflammable objects, water or metallic objects to get inside the unit, as it will cause damage or malfunction.
- Do not modify the unit or operate it without cover panel to prevent danger.
- When there is any abnormality (abnormal noise, smell, smoke, etc.) with the unit, immediately turn the power off and take the unit to your nearest JVC-authorized service agent.

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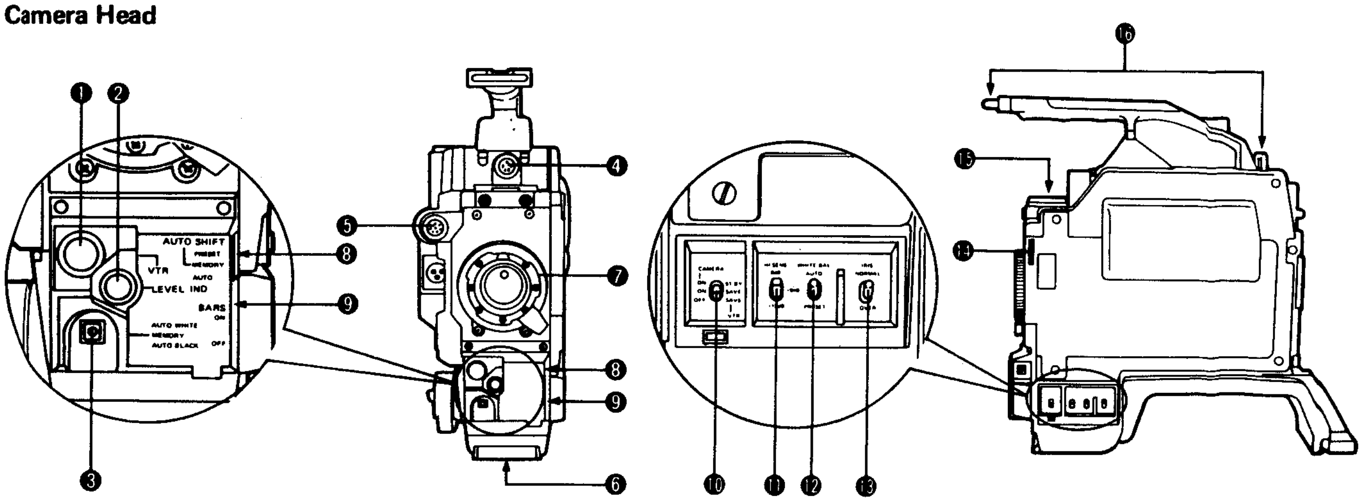
* Registered trademark

Handling Precautions

- **Power voltage**
  Make sure that the power is between 10.5 V and 15 V DC. If the power voltage is too low, abnormal colour and increased noise could occur. Do not exceed 15 V DC in any case, or the unit could be damaged.
- **Warming up**
  The unit is stabilized sufficiently for normal use about 40 seconds after switching the power on. However, better stabilization can only be obtained after 10 minutes or more.
- **Pickup tube protection**
  Do not aim the lens to sun or other strong light sources, fluorescent lamp, reflector, etc. even when the power is switched off, to prevent damage to the pickup tubes. Be sure to keep the lens capped unless shooting or preparing to shoot.
- **Connection with portable video recorder**
  Different recorders require different start/stop triggering modes and connection cables. Before connection, carefully read "Connection to Video Recorder" on page 14.
- **Intercom headset**
  When the receiver of an intercom headset is put too near the camera, magnetism from it could affect the camera registration or colour balance. Pay attention not to place the headset on the camera.
- **Ambient temperature**
  The temperature in which the camera can be operated depends on the type of pickup tubes used. Refer to the corresponding item in the "Specifications" on page 28. However, operation near the highest temperature should be restricted to within two hours to prevent damage to the tubes.
- Where there are strong electromagnetic waves or magnetism, for example near a radio or TV transmitter, transformer, motor, etc., the picture may contain noise and the colours may be incorrect.
- When a wireless microphone or wireless microphone tuner is used near the camera, the tuner could pick up noise. In such a case, select another channel.

CONTROLS, CONNECTORS AND INDICATORS

Camera Head



❶ **Video recorder start switch (VTR)**
For start/stop triggering of the video recorder. When the standard zoom lens is used, this button functions in parallel with the VTR switch on the lens.

❷ **Level indicator switch (LEVEL IND.)** (See page 25)
For switching on/off the video level indicator in the viewfinder.

❸ **Auto White/Black balance switch**
Auto white adjustment is possible when the WHITE BAL. switch ⓬ in the switchbox is set to "AUTO".

AUTO WHITE:	By flipping up the lever to this position while shooting a white subject, the white balance is adjusted automatically.
AUTO BLACK:	By flipping down the level to this side, the lens iris is closed and the black balance is adjusted automatically.
MEMORY:	In this positition the above adjustments are stored in memory.

④ Viewfinder connector (VF)
The connection can be made by sliding the optional view finder along the mount shoe ⑮.

⑤ Lens connector (LENS)
Connect with the cable from the standard lens.

⑥ Tripod base mount

⑦ Lens mount ring

⑧ Auto-shift switch (AUTO SHIFT)
PRESET: For preset registration.
MEMORY: In this position the above adjustment is stored in memory.
AUTO: By flipping down the lever to this position while shooting a normal subject, the centering adjustment of registration is performed automatically.

⑨ Colour bar switch (BARS)
By setting the switch under the cover to "ON", the colour bar signal is output from the video output.

⑩ Operation switch (CAMERA ON/ON/OFF, VTR ST-BY/SAVE/SAVE) (See page 17)
Three positions are provided for camera power ON, OFF and video recorder "power-save" mode.

⑪ Sensitivity select switch (HI-SENS)
For use in low light conditions, the camera sensitivity gain can be boosted by +9 dB or +18 dB. Normally set this to "0 dB".

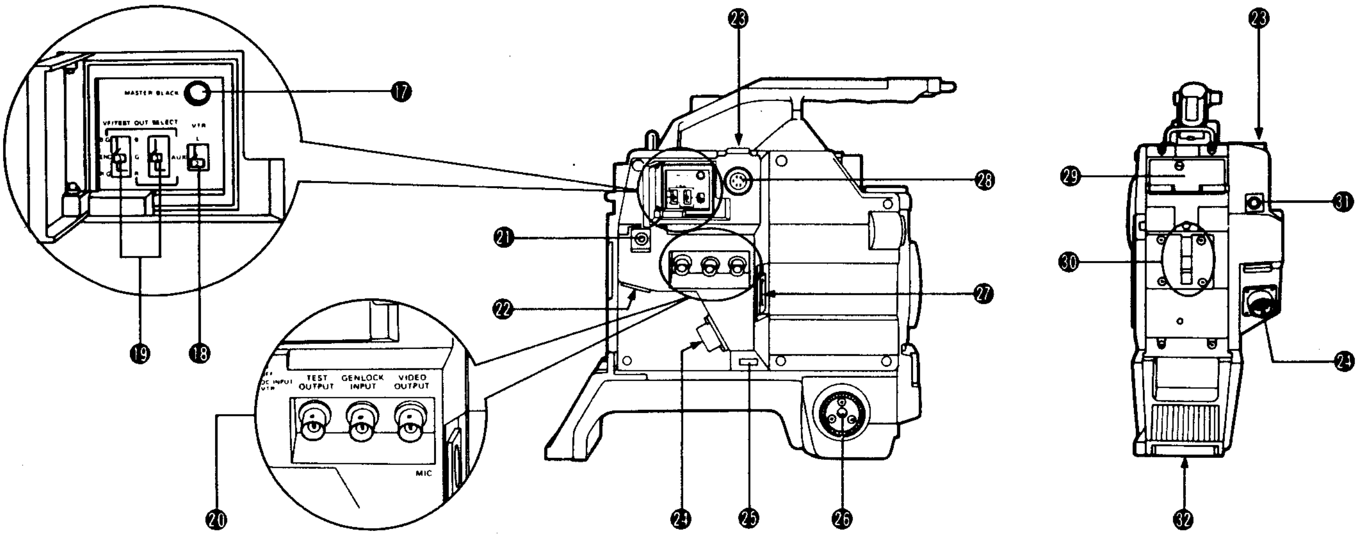
⑫ White balance adjustment mode switch (WHITE BAL.)
AUTO: For automatic adjustment using switch ③.
PRESET: Preset position for a color temperature of 3200 K.

⑬ Iris level switch (IRIS) (See page 18)
For varying the level set as standard for auto iris operation.

⑭ Filter turret
The turret for the Neutral Density and colour temperature conversion filters is provided with four positions.
1. CLOSE: Same condition as lens being capped.
2. 3200 K: For shooting indoors or outdoors with insufficient light.
3. 5600 K: For shooting outdoors.
4. 5600 K + 25 % ND: The 25 % ND filter and 5600 K colour filter are combined for shooting outdoors on a fine day.

⑮ Viewfinder mount shoe
For the optional VF-215 Viewfinder.

⑯ Shoulder belt hooks
For the shoulder belt provided.



⑰ Master black level control (MASTER BLACK)

⑱ Video recorder triggering mode switch (VTR) (See page 12)
Set according to the start/stop triggering mode of the video recorder connected.

⑲ Viewfinder and test output signal select switches (VF/TEST OUT SELECT) (See page 9)
For the selection of the signals output at the TEST OUTPUT connector and at the viewfinder.

⑳ Signal connectors

VIDEO OUTPUT:	Composite video signal is output.
GENLOCK INPUT:	To genlock the camera, the Composite video or BB (black burst) signal should be externally input here.
TEST OUTPUT:	The test signal selected by VF/TEST OUT SELECT switch ⑲ is output.

㉑ Power select switch (POWER)

The power supply source can be selected or completely cut off using this switch.

RS:	Set to this position when the optional RS-500 Remote Control Unit is used.
OFF:	The power supply to the camera is completely cut off.
DC INPUT/VTR:	Power is supplied via DC INPUT connector ㉒ or VTR connector ㉔ .

NOTE: Refer to the video recorder's instructions for limited output current of recorder power supply.

㉒ DC power input connector (DC INPUT)

Use this 4-pin Cannon XLR connector for supplying 12 V DC from the optional DC-C50 Battery Pack or the optional AA-C50 AC Power Adapter.

Pin No.	Function
1	EARTH
2	
3	
4	+12 V

㉓ Microphone holder mount shoe

㉔ Video recorder connector (VTR)

Use this 14-pin connector for the connection of a portable video recorder.

Pin No.	Function	Pin No.	Function
1	DC (EARTH)	8	EARTH
2	DC 12 V IN	9	RETURN VIDEO IN
3	MIC (HOT)	10	BATTERY INDICATION IN
4	MIC (COLD)	11	COLOUR FRAMING PULSE OUT
5	MIC SHIELD	12	REC/ALARM SIGNAL IN
6	VIDEO OUT/IN (HOT)	13	VTR START/STOP SIG OUT
7	VIDEO OUT/IN SHIELD	14	POWER SAVE OUT/AUDIO MONITOR IN

㉕ Microphone output level switch (MIC LEVEL)

The audio output level via the VTR connector ㉔ can be switched in two steps.

HIGH: Approx. -20 dB level.

LOW: Through-microphone output level.

㉖ Chest rest lock

㉗ Microphone input jack (MIC INPUT)

This jack is provided for the connection of microphones with a 4-pin Cannon connector. The input is parallel with the MIC connector ㉘ .

㉘ Exclusive microphone connector (MIC) (See page 13)

For the connection of the optional M-K50 Microphone. The power for the electret condenser microphone is supplied via this 6-pin socket.

㉙ Remote control unit connector

When the optional RS-500 Remote Control Unit is used, connect its Camera Adapter here. (For details, see instructions provided with the RS-500.)

㉚ Battery holder

The optional DC-C50 or DC-C19 Battery Pack can be slid onto the rear of the camera.

㉛ Earphone jack (EARPHONE)

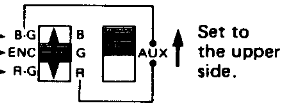
When the portable video recorder used is able to provide an audio signal to the camera, the playback audio signal can be monitored through this 1/8" (3.6 mm) mini jack.

㉜ Tripod base mount

- **Viewfinder and test output select switches (VF/TEST OUT SELECT)**

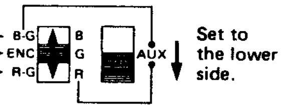
One of seven signals ① through ⑦ can be output by the viewfinder and the TEST OUTPUT connectors.

① ENC (colour encoder) output
② B-G output
(used to check registration)
③ R-G output
(used to check registration)



Signals from ① to ③ can be output with the setting shown above.

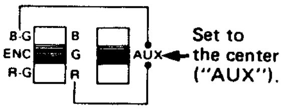
④ B channel signal output
⑤ G channel signal output
⑥ R channel signal output



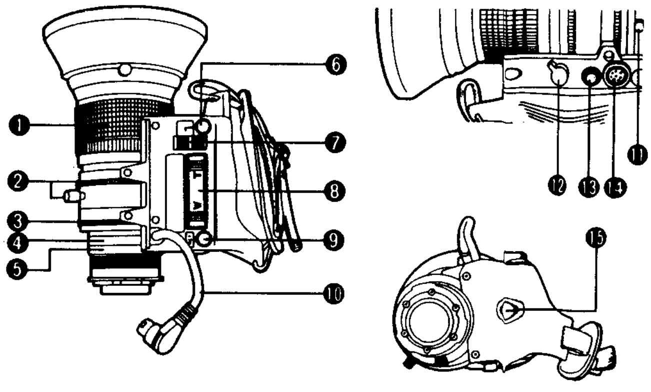
Signals from ④ to ⑥ can be output with the setting shown above.

⑦ AUX signal output

This is available with the switch setting shown on the right.



Zoom Lens (Optional HZ-510)



❶ Focus ring

❷ Zoom lever/zoom ring

For manual zooming.

❸ Iris ring

When the Iris mode switch ❼ is set to "M", the iris can be opened and closed manually using this ring.

❹ Back focus ring

For the back focus adjustment.

❺ Macro ring

❻ Momentary iris switch

Even during the manual iris operation with the Iris mode switch set to "M" (Manual), iris control can be automatic as long as this button is kept depressed.

❼ **Iris mode switch**
A: For auto iris operation.
M: For manual iris operation.
R: For remote control operation (using the RS-500).

❽ **Zoom servo lever**
The speed and direction of the servo zooming is controlled by this see-saw switch.

❾ **Video signal return switch (RET)**
The return video signal from the video recorder can be monitored in the viewfinder while this switch is depressed.

❿ **Lens cable**
Connect to the LENS connector on the camera head.

⓫ **Securing knob**
For fixing the back focus ring.

⓬ **Zooming mode switch knob (ZOOM)**
S: For servo zooming.
M: For manual zooming.

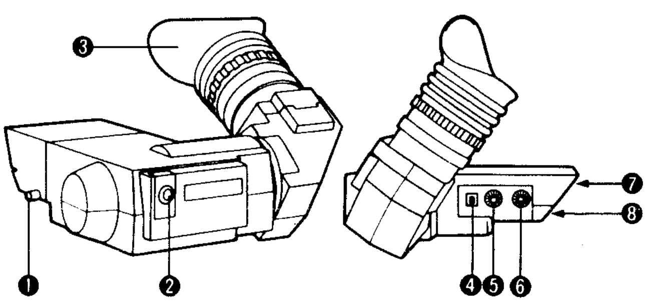
⓭ **Focus servo control connector**

⓮ **Zoom servo control connector**

⓯ **Video recorder triggering switch (VTR)**
For the start/stop operation of the video recorder.

NOTE: When a lens other than the optional HZ-510 is used, the image may sometimes contain dynamic shading at the top and the bottom: it is necessary to perform internal adjust and, in some cases, re-adjustment of back focus. For details, consult your dealer.

Viewfinder (Optional VF-215)



❶ **Fixing screw**
For fixing the viewfinder to the camera head.

❷ **Tally lamp**
When the camera is used in connection with a portable video recorder, this LED lights to indicate the record mode.

❸ **Eyepiece**
Dioptre adjustment is possible.

❹ **Peaking switch (PEAKING)**
For enhancing the picture contours so that focusing is easier.

❺ **Contrast control (CONT)**

❻ **Brightness control (BRIGHT)**

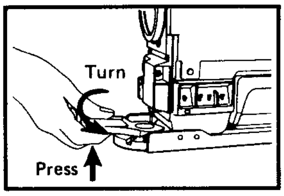
❼ **Viewfinder connector**
The connection is made by mounting the viewfinder on the camera head.

❽ **Viewfinder mount bracket**

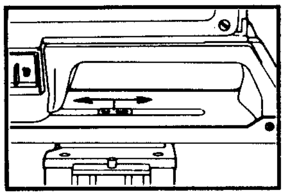
INSTALLATION

Tripod Installation (Using the KA-500 Tripod Base)

1. The tripod base has 1/4" and 3/8" holes. Use the one that matches the tripod.
2. Place the camera on the tripod base (with the base's lever under the camera front). Secure the base by turning the lever towards the fixing slot while depressing the lock button.



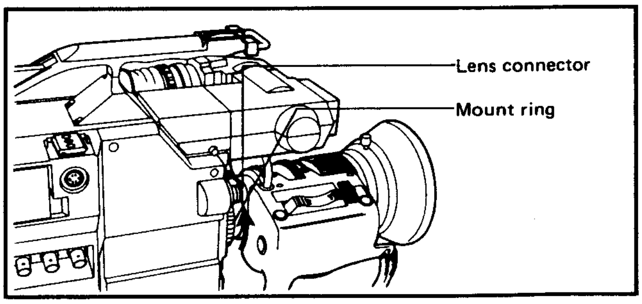
3. The tripod mount hole section can be slid backwards and forwards: To balance the camera on the tripod, loosen the tripod screw, slide to the best position and secure the tripod screw.



NOTE: When removing the camera from the tripod, do not turn the lever of tripod base too violently so that the camera does not fall or drop due to the shock. Be sure to turn the lever slowly while holding the camera with one hand.

Lens Installation (Optional HZ-510)

– Before mounting/removing the lens, set the filter turret to position "1" (CLOSE).

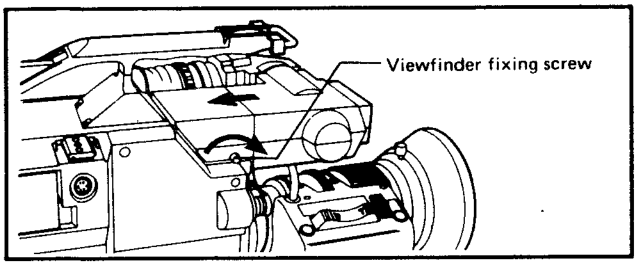


1. Remove the cap on the lens mount section, paying attention not to allow dirts, etc. to enter inside the mount.
2. Align the pin on the lens with the notch in the mount and then turn the mount ring clockwise until the lens and lens mount are secured tightly.
3. Connect the lens cable to the camera head.

NOTE: Make sure that the lens is firmly attached. Otherwise, the back focus adjustment may be incorrect.

Viewfinder Installation (Optional VF-215)

1. Insert the viewfinder from the camera front, aligning the viewfinder slot with the viewfinder mount shoe on the camera.
2. After the viewfinder has been fully inserted, secure the viewfinder fixing screw using a screwdriver.



Video Recorder Triggering Mode Selection

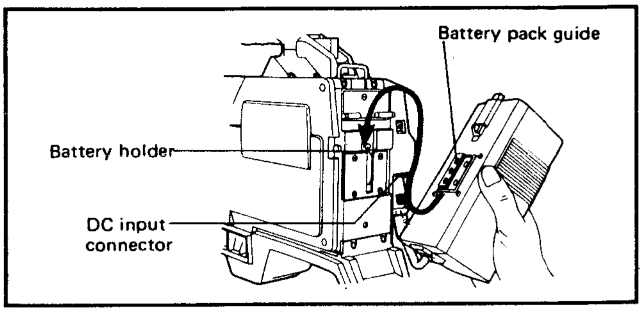
The VTR select switch allows the selection of the video recorder start/stop signal according to the recorder connected. Set the switch following the table.

Switch position	Connector of the VCR	Trigger mode
L	10-pin	Earth start
B	14-pin	+4 V start

NOTE: The VTR select switch is initially set to "B" before shipment.

Battery Pack Installation (Optional DC-C50)

1. Insert the battery pack guide into the battery holder ㉚ and press down until it locks.
2. Insert the battery pack connector into the DC INPUT connector ㉒ of camera.



Battery pack operation

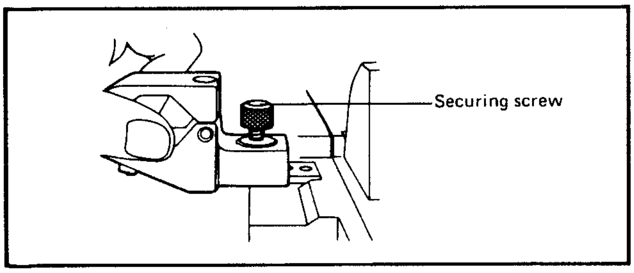
- With a fully-charged DC-C50 Battery Pack, the camera will operate for approx. 60 minutes at normal temperatures (about 25°C (77°F)).
- Be sure to charge the battery pack before recording. It is also recommended to have some spare charged battery packs ready.
- Replace the battery pack when the BATT indicator (red) in the viewfinder starts flickering.
- Use the optional AA-C50 AC Power Adapter to charge the battery pack. For the charging procedure, refer to the AA-C50's instruction manual.

Microphone Installation

Ordinary microphone

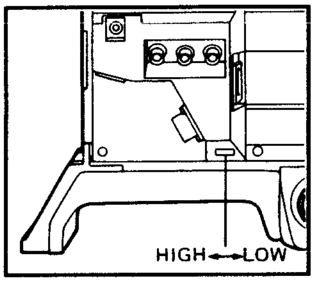
— Microphones can be installed on the camera head using the mic holder provided.

1. Insert the mic holder into the microphone holder shoe on the upper left of the camera and secure with the screw.
2. Plug the microphone output cable into the 3-pin MC INPUT connector on the camera head.



Microphone output level

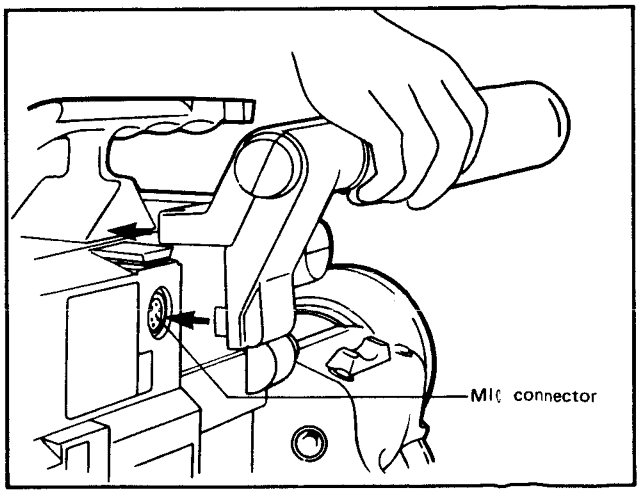
The microphone output level can be switched to "HIGH" (approx. -20 dB) and "LOW" (through-output).



Exclusive microphone (optional M-K50)

The M-K50 Microphone snaps directly onto the camera head. The exclusive 6-pin connector has the configuration shown in the table.

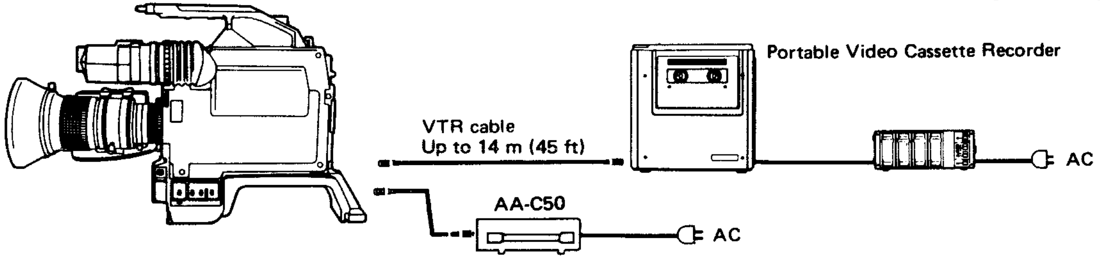
Pin No.	Function
A	NC
B	+9 V OUT
C	EARTH
D	MIC (HOT)
E	MIC (COLD)
F	EARTH (SHIELD)



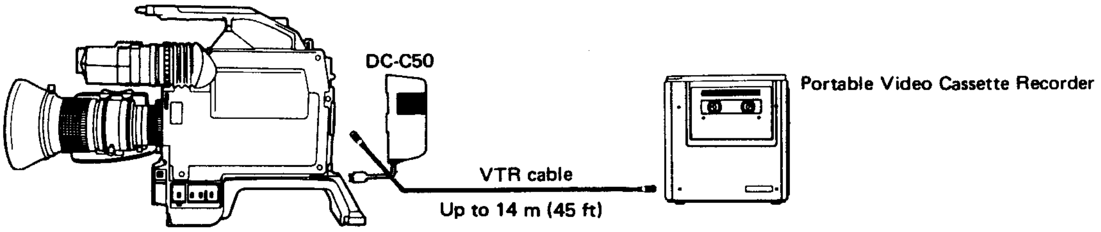
CONNECTION TO VIDEO RECORDER

Operation on AC Power Line

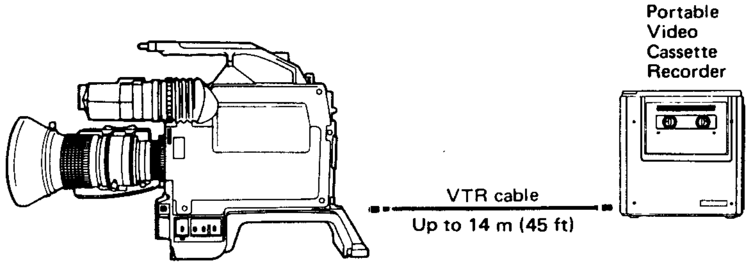
The KY-210 is designed to be ideal for use with portable video recorders manufactured by JVC. Some recorders from other manufacturers will not function correctly with the connections shown; before connecting, consult your dealer.


Portable Video Cassette Recorder
VTR cable
Up to 14 m (45 ft)
AC
AA-C50
AC

Operation with Battery Pack (Optional DC-C50)


DC-C50
Portable Video Cassette Recorder
VTR cable
Up to 14 m (45 ft)

Operation on Power Supply from the Portable Video Recorder

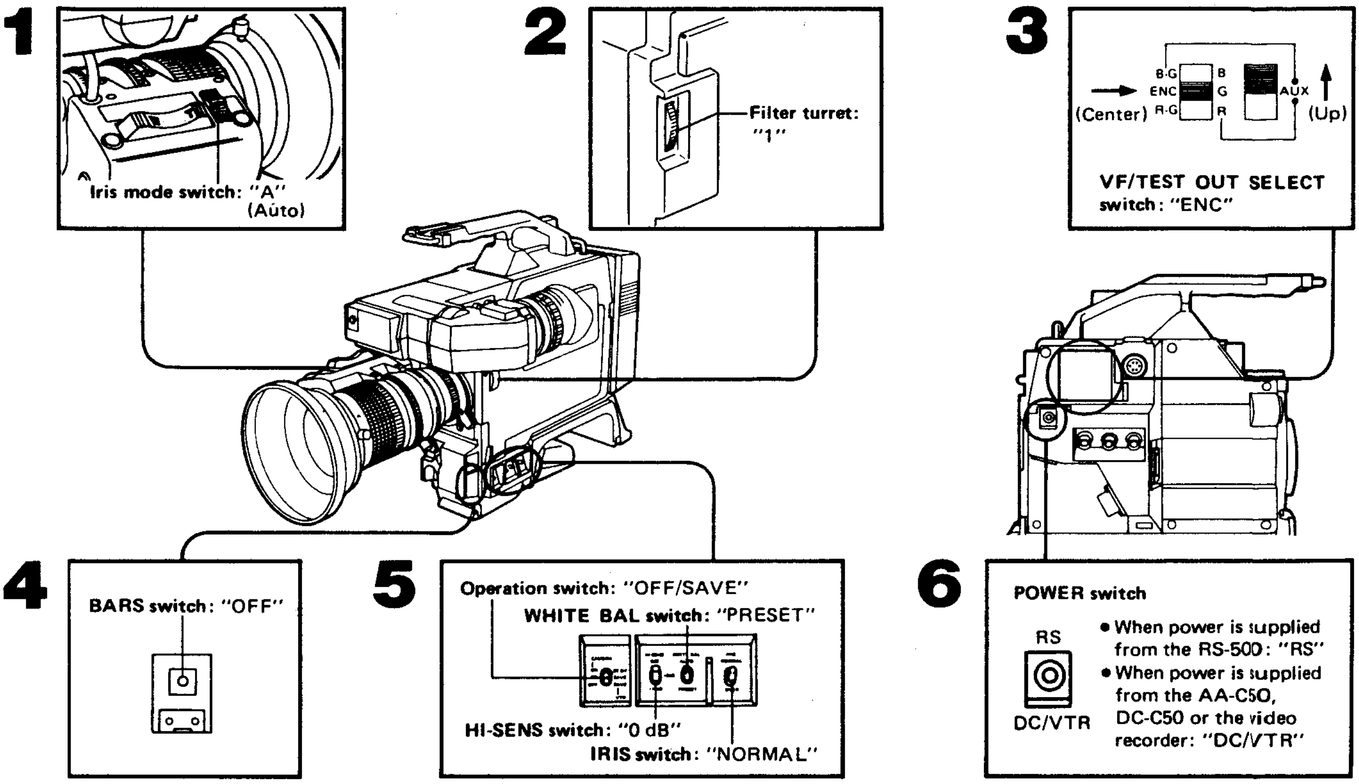

Portable Video Cassette Recorder
VTR cable
Up to 14 m (45 ft)

NOTE: If the camera is operated from the battery in the portable video recorder, the unit may not operate or the battery operation time could be very short due to small capacity of the battery. The power supply to the camera should not exceed the rated current capacity of the video recorder.

Video recorder connected	VTR cable, 2m/6.5ft (extension, 10m/32.5ft)	Trigger mode	Microphone level	Audio monitor	Alarm display	
					Camera/recorder battery	Tape end or servo trouble
CR-4400	VC-511B-2 (VC-582B)	L	H: -20 dB	×	○/×	×
HR-C3	VC-511B-2 (VC-582B)	L	H: -20 dB	○	○/○	×
BR-6200	VC-511B-2 (VC-582B)	L	H: -20 dB	×	○/×	×
CR-4700	VC-512B-2 (VC-589B)	B	L: -52 dBm or H: -20 dB	○	○/○	○

○ : Possible
× : Impossible

PREPARATION


1
Iris mode switch: "A" (Auto)
2
Filter turret: "1"
3
B-G ENC R-G
B G R
AUX
(Center)
(Up)
VF/TEST OUT SELECT switch: "ENC"
4
BARS switch: "OFF"
5
Operation switch: "OFF/SAVE"
WHITE BAL switch: "PRESET"
HI-SENS switch: "0 dB"
IRIS switch: "NORMAL"
6
POWER switch
RS
DC/VTR
• When power is supplied from the RS-500: "RS"
• When power is supplied from the AA-C50, DC-C50 or the video recorder: "DC/VTR"

To record a clear picture with correct colours, it is necessary to adjust the white balance, black balance and registration. Before adjustment, set the switches as follows:

1. Set the Operation switch to "ON/SAVE".
    - The beam current will flow in the pickup tubes to make possible shooting. The lens iris will also open.
    - The Operation switch has the following three positions. Power of specific video recorders can be saved using the "SAVE" positions.

Switch position	Camera mode	Video recorder mode	
		14-pin recorder	10-pin recorder
ON/ST BY	On	Standby	Standby
ON/SAVE	On	Power-save	Standby
OFF/SAVE	Off	Power-save	—

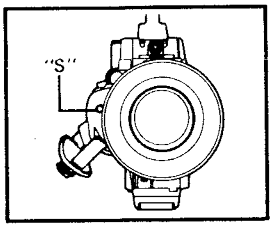
2. To obtain an image with correct colour, set the filter turret according to the illumination of the object.

Turret position	Setting	Conditions
1	CLOSE	When the camera is not used
2	3200 K	Studio lighting, sunrise or sunset outdoors
3	5600 K	Outdoors; cloudy or rainy weather
4	5600 K + 25 % ND	Outdoors; fine weater

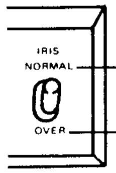
3. Point the camera to a normal object, operate the lens and monitor the picture in the viewfinder screen.
    - Adjust the BRIGHT and CONT controls of the viewfinder.
    - When the BATT indicator (red) in the viewfinder flickers, the battery pack is nearly exhausted: replace with a fully-charged battery pack.

LENS IRIS ADJUSTMENT

- With the HZ-510, iris adjustment is not necessary when the Iris mode switch (A/M) on the lens is set to "A".
  The iris closes automatically in following conditions:
  1) When the BARS switch is set to "ON".
  2) When the Operation switch is set to "OFF/SAVE".
  3) When the Auto White/Black switch is flipped down to "AUTO BLACK" during auto black balance adjustment.
- With certain lenses, the auto iris operation causes hunting due to overreaction. In such case, adjust the "S" potentiometer on the lens following the procedure below.
  1. Set the Iris mode switch (A/M) to "A" for automatic control.
  2. Adjust the lighting so that the iris is set to f/5.6.
  3. Cap the lens to prevent light from entering the lens. (The iris will be fully open.)
  4. Uncover the lens. If the iris is unstable around f/5.6, adjust the "S" potentiometer.
  5. Check the iris operation with the HI-SENS switch set at "+9 dB" and "+18 dB". If there is still hunting, repeat steps 2 through 4.



- In manual iris control operation, setting the LEVEL IND switch to "ON" displays a zebra pattern in the viewfiner; this indicates 90 to 100 % of the video level by stripes. Use this display for reference.
- In auto iris operation, when the subject is relatively dark compared to the Average Picture Level (or in the opposite case), use the IRIS switch to vary the set value to match the level of the subject.



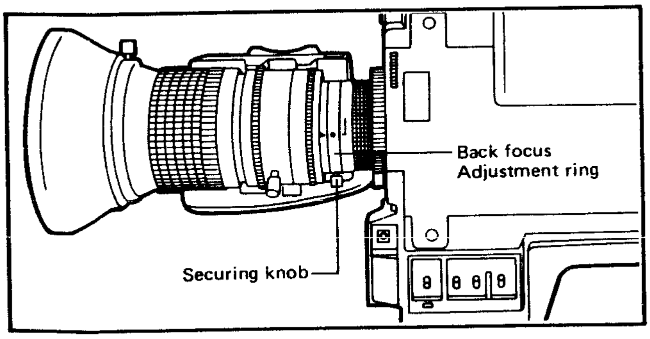
NORMAL: Standard value

OVER: 0.5 f-stop open.

BACK FOCUS ADJUSTMENT

With the HZ-510, the back focus can be adjusted on the lens body. Before adjustment, check that the lens is mounted securely on the camera.

1. Shoot a registration chart with the iris fully open (manual iris operation).
2. If the lighting is too strong, decrease it or change the place.
3. Watching the G signal on the viewfinder, zoom up and adjust the focus.
4. Zoom out to the wide-angle position, then turn the securing knob counterclockwise to loosen it and turn the back focus ring so that the focusing is best.

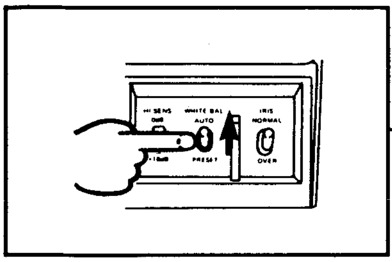


5. Repeat this a few times for fine adjustment.
6. After adjustment, tighten the securing knob.

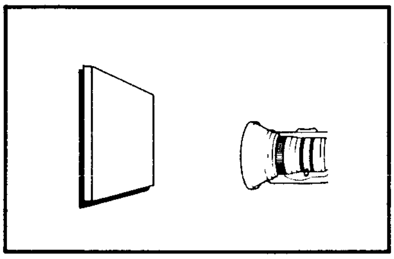
NOTE: The back focus adjustment is more accurate when the distance between the subject (chart) and camera is more than 3 m (10 ft).

WHITE BALANCE ADJUSTMENT

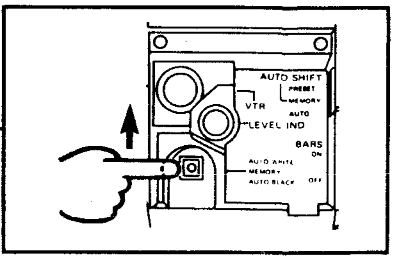
1 Set the WHITE BAL switch in the switchbox to "AUTO".

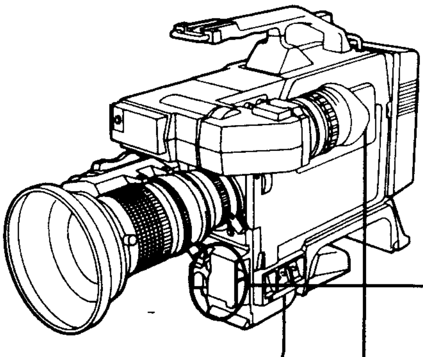

HI SENS
WHITE BAL
IRIS
AUTO
NORMAL
PRESET
OVER

2 Shoot a white object (cloth, wall, etc.) so as to fill the viewfinder screen.

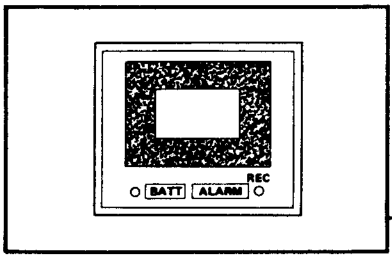


3 Flip up and hold the Auto White/Black balance switch on the "AUTO WHITE" side.

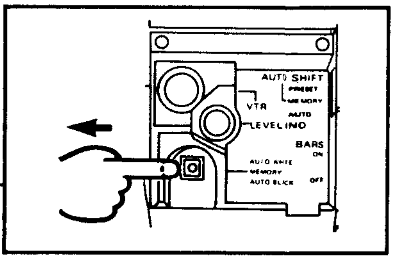

AUTO SHIFT
PRESET
MEMORY
VTR
AUTO
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF



4 A white square sign is displayed in the viewfinder screen and disappears when the adjustment is complete.

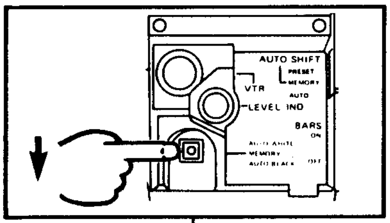

REC
BATT
ALARM

5 Now release the switch. The status obtained by auto white balance adjustment is stored in memory.

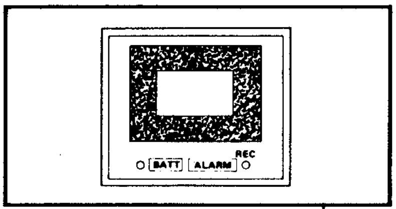

AUTO SHIFT
PRESET
MEMORY
VTR
AUTO
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF

BLACK BALANCE ADJUSTMENT

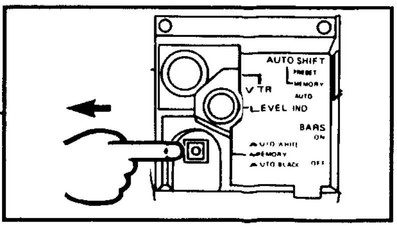
1 Flip down and hold the Auto White/Black balance switch to the "AUTO BLACK" side.

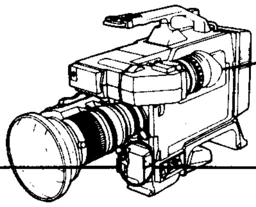

AUTO SHIFT
PRESET
MEMORY
VTR
AUTO
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF

2 A white square sign is displayed in the viewfinder screen and disappears when the adjustment is complete.


REC
BATT
ALARM

3 Now release the switch lever. The status obtained is stored in memory.


AUTO SHIFT
PRESET
MEMORY
VTR
AUTO
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF



4 Then repeat the white balance adjustment described on the previous page. After the adjustments of both, the white and black balances are complete.

NOTES:

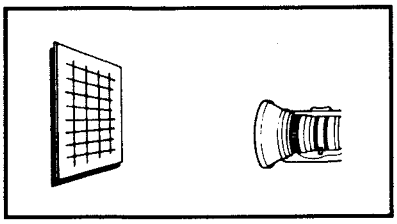
- The memory of the statuses obtained by the automatic adjustments are backed up by a small built-in battery even after the power is switched off. The memory is not lost until the battery is exhausted or it is removed for replacement. (For the replacement, consult your nearest JVC-authorized service agent.)
- Even when the Iris mode switch in the lens section is set to "MANU", the iris closes automatically during the black balance adjustment and is left closed when the black balance adjustment is over.
- If the white square does not disappear during white balance adjustment though the Auto White/Black balance switch is kept flipped up, the color temperature may be out of the adjustable range or the lighting may not be bright enough. In such a case re-set the color filter or increase the lighting.
- When shooting under different light sources, re-set the color filter and auto white/black balance every time.

REGISTRATION ADJUSTMENT (AUTO SHIFT REGISTRATION)

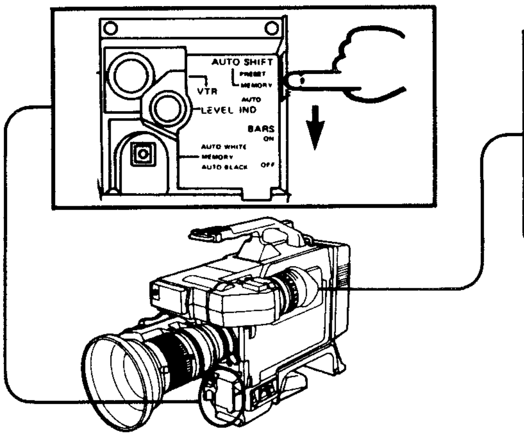
The registration circuit of the KY-210 is provided with an auto shift circuit. Registration adjustment using the auto shift function is performed following the procedure below.

Before adjustment, the white balance and black balance adjustment should have been performed.

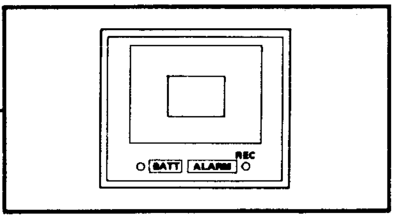
1 Shoot a black and white object with clear outlines (a registration pattern, crosshatch pattern, etc.) so that it fills the viewfinder screen.



2 Flip down and hold the AUTO SHIFT switch to the "AUTO" side.


AUTO SHIFT
PRESET
MEMORY
VTR
AUTO
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF

3 A sign as shown below is displayed in the viewfinder screen and disappears when the adjustment is complete.


BATT
ALARM
REC

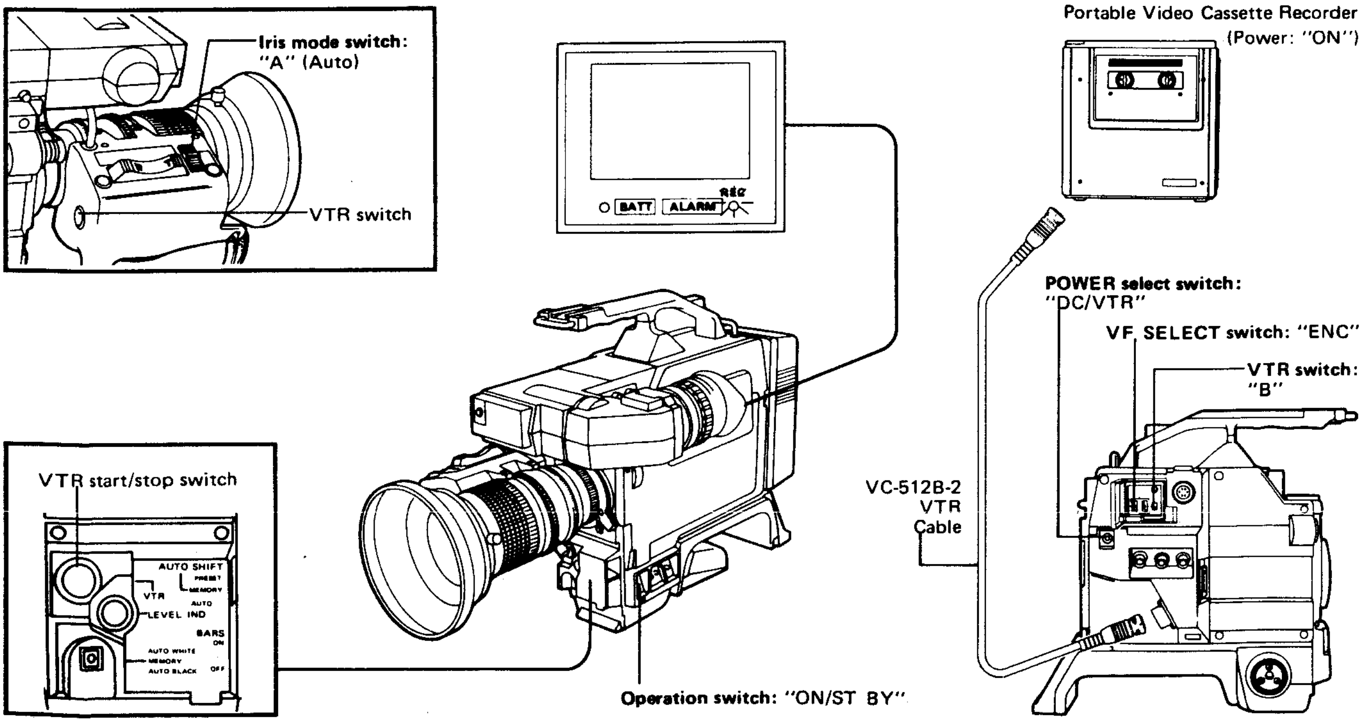
4 Now release the switch. The status obtained by the adjustment is automatically stored in memory.

- **Object for use in adjustment**
  For correct auto shift registration, it is recommended to use the registration pattern provided.

NOTES:

- In this adjustment, set the distance between the object and camera so that the lens zoom position is around the center (not at tele or wide side).
- If the sign does not disappear though the AUTO SHIFT switch is kept flipped down, re-start adjustment, checking the following.
  1) If the lens iris is adjusted properly (especially in manual iris operation).
  2) If the focus is correct.
  3) If the object has few edges or if it is colored.

RECORDING PROCEDURE – Using a Portable Video Recorder (JVC CR-4700) –


Iris mode switch: "A" (Auto)
VTR switch
BATT
ALARM
REC
Portable Video Cassette Recorder (Power: "ON")
POWER select switch: "DC/VTR"
VF SELECT switch: "ENC"
VTR switch: "B"
VTR start/stop switch
AUTO SHIFT
PRESET
MEMORY
VTR
AUTO
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF
VC-512B-2 VTR Cable
Operation switch: "ON/ST BY"

Before Recording

1. Connect the portable video recorder following the instruction in "Connection to Video Recorder".
2. Set the switches as indicated on the previous page.
3. Adjust the white and black balance.
4. Put the recorder in the record mode.
5. When the tape starts to tun, press the VTR switch on the lens.
   – The recorder will enter the record-pause mode.

   Now the preparations are complete.

Recording

1. Press the VTR switch on the lens to start recording.
   – The REC indicator (green) in the viewfinder will light.
2. To monitor the return video signal or video recorder playback signal in the viewfinder, press the RET switch on the lens.
   – When the camera is connected with an ordinary non-portable video recorder, the start and stop operation may have to be executed from the recorder.
3. To monitor the microphone signal, use the EARPHONE jack on the left side of the camera head.
4. The KY-210 is able to supply a colour framing pulse to the VCR via the 14-pin VTR connector only when the camera is synchronized internally. When external genlock is used, the colour framing pulse output is automatically cut off.

●●

For the operation of the portable video recorder, see its instruction manual.

●●

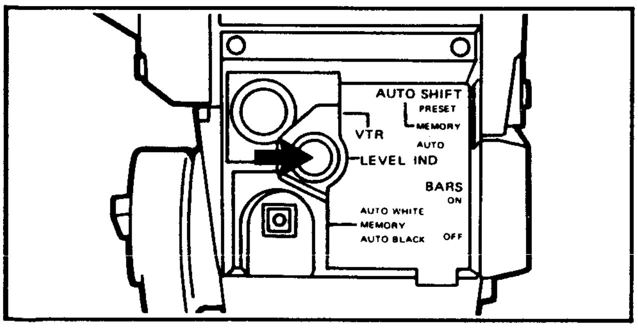
FACILITIES OF THE VF-215 VIEWFINDER

Video Level Indication

With the optional VF-215 Viewfinder, 90 to 100 % of the video signal level can be indicated by stripes. This zebra pattern is displayed only when the VF/TEST OUT SELECT switch is in the "ENC" position, and not in the "REG", "R", "G" and "B" positions.

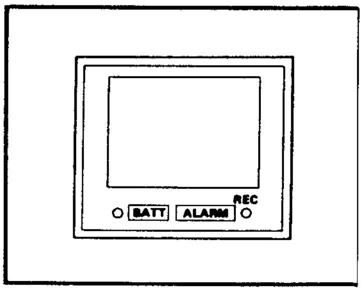
This video level indication is designed for use as the reference in manual iris control operation.

The LEVEL IND switch is an alternate switch which switches the indication on and off each time it is pressed.



Warning Indication

Two indicator LEDs are provided inside the VF-215 viewfinder to give a warning during shooting.



BATT lamp (red)

The red LED flashes when the camera battery or recorder battery (with specific recorders) is almost exhausted.

REC lamp (green)

The green LED lights during recording, interlocked with the lighting of the front tally lamp.

ALARM lamp (green)

The green LED flashes when the video recorder has servo trouble or the tape reaches its end (with specific recorders).

NOTE: The above warning functions depend on the recorder. For details of items which can be indicated, refer to the recorder's instruction manual.

Monitoring the Picture

When the camera and portable video recorder are connected via a VTR cable, the video signal from the recorder can be monitored in the viewfinder as shown below.

The playback video monitoring is especially convenient as it allows the picture to be checked immediately after recording.

The picture monitored differs according to the VF/TEST OUT SELECT switch position and the recorder used.

VCR model		Camera picture	Playback video
10-pin	CR-4400	Automatic switching when the switch is set to "ENC".	
	HR-C3		
	BR-6200		
14-pin	CR-4700	ENC	RET*

*RET: Monitoring is possible only when the RET switch on the lens is depressed. As the real-time monitoring function of the CR-4700 Portable VCR is treated the same as playback video monitoring, it is also possible only when the RET switch is depressed.

- For the video recorder playback operation, refer to the recorder's instructions.

GENLOCK OPERATION

The genlock operation is possible by applying a composite video signal (VBS) or black burst signal (BB) to the GEN-LOCK INPUT terminal.

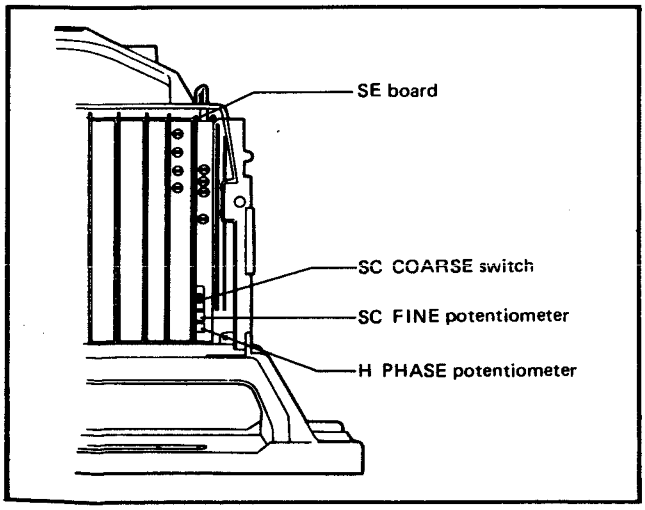
The phase of the composite video signal output from the camera can be varied according to the reference input signal, within the ranges below.

Horizontal sync: +3 to −0.5 μs

Color sync: 360°

Phase adjustment procedure

1. Remove the right side cover of the camera.



2. Adjust the following controls on the SE board.

H sync phase: H PHASE potentiometer

Color sync phase: SC FINE potentiometer (±60°)

SC COARSE switch (0°/120°/240°)

NOTE: The video recorder playback signal cannot be used for genlock operation. When the recorder playback signal has to be used as the reference signal, the signal should be corrected using a time base corrector (TBC), etc.

SPECIFICATIONS

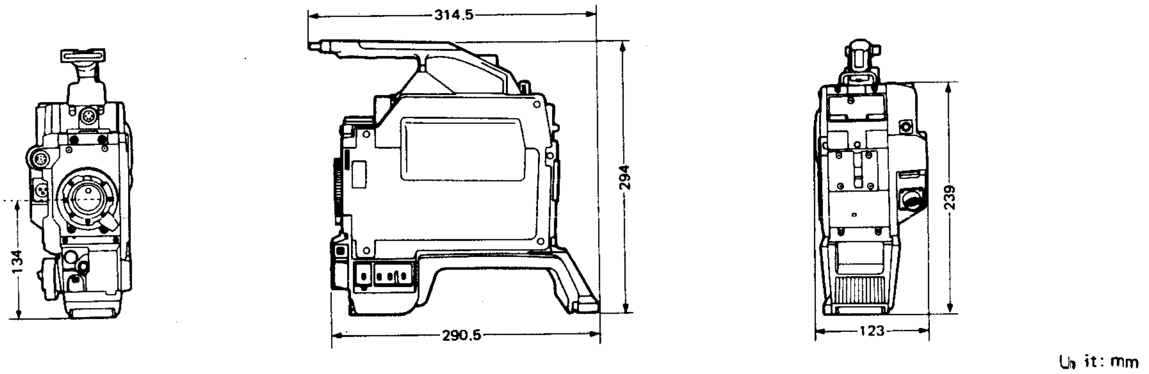
Colour Video Camera KY-210

Optical system : f/1.4 three-tube RGB prism system (with quartz filter)
Lens mount : Bayonet
Optical filter : Closed, 3200 K, 5600 K, 5600 K + 25 % ND
Pickup tubes : 2/3" Saticon* H4101 Electrostatic focus/electromagnetic deflection
Sensitivity : f/4 at 2000 lux
S/N ratio : 57 dB nominal (4.2 MHz Bandwidth -NTSC
54 dB nominal (5 MHz Bandwidth) -PAL
GAMMA; Unity
Contour corrector; OFF
Sensitivity selection : 0 dB, +9 dB, +18 dB
Minimum illumination : f/1.6, 40 lux (+18 dB switch ON)
Registration : Zone 1: Within 0.1 % (Circle 80 % of picture height)
Zone 2: Within 0.2 % (Circle of picture width)
Zone 3: Within 0.4 % (Zone outside the Zone 2)
Horizontal resolution : 650 lines (G ch center)
Contour correction : Horizontal: Dual-edged
Vertical: 2 H (with comb filter)
Encoder : NTSC (I.Q.)/PAL (U.V)
Matrix masking : Provided
Color bar generator : Provided.
Synchronizing system : Internal (built-in RS-170A SSG; NTSC/built-in PAL-B SPG; PAL) or External genlocking by composite video or black burst
Color framing pulse output provided
Blanking adjustment : Provided
Auto iris : Normal and +50 % (a half f stop) selector provided
Input signals : Return video signal: Composite video, 1 Vp-p, 75 Ω
Genlock signal: Composite video (VBS, 1 Vp-p, 75 Ω) or black burst (BB, 0.45 Vp-p, 75 Ω)
Microphone: -52 dBm, 600 Ω balanced
Output signals : Composite video signals (VBS): 1 Vp-p, 75 Ω (x 2, from BNC and 14-pin connectors)
Test signal (VS/VBS): R, G, B, R-G, B-G, ENC, AUX
Audio signal: -52 dBm, 600 Ω balanced/-20 dBs, unbalanced (switchable)
Audio monitor signal: 8 Ω, -20 dB
Video recorder control signal: Contact or +4 V supply (switchable)
Ambient temperature range : -20 to 45°C (-4 to 113°F)
Power consumption : 12 V DC, 1.5 A (NTSC)/1.55 A (PAL)
Weight : 3.5 kg (7.8 lbs)

Standard accessories : Mic holder (SCUA 30312)
Tripod base (KA-500),
Extension board,
Registration pattern (GP43078),
Dust cover,
Shoulder belt,
Chest rest (KA-111),
PWB extractor

*Registered trademark

Dimensions



Design and specifications subject to change without notice.

BEDIENUNGSANLEITUNG: FARBVIDEOKAMERA KY-210

Änderungen der in dieser Bedienungsanleitung enthaltenen Daten sind vorbehalten.

ACHTUNG:

SCHÜTZEN SIE DIESES GERÄT VOR REGEN UND FEUCHTIGKEIT, DAMIT ES NICHT IN BRAND GERÄT ODER EIN KURZSCHLUSS ENTSTEHT.

Schutz der Röhrenvorderseite

Die Röhrenvorderseite wird durch starke Lichtstrahlen beschädigt. Richten Sie deshalb die Kamera nicht direkt auf die Sonne. Wenn die Ablenkungsschaltung ausfällt, schalten Sie sofort den Netzschalter aus und bringen Sie den Objektivdeckel an, um die Röhre vor möglichen Beschädigungen zu schützen.

Ist die Kamera nicht in Gebrauch, versichern Sie sich bitte, daß der Objektivdeckel aufgesetzt und der Filter (⓭ auf Seite 36) in Stellung "1" gebracht ist.

SPANNUNGSSYSTEM

Diese Farbvideokamera kann nur mit 12 V Gleichstrom betrieben werden.

VORSICHT:

Zur Vermeidung von Kurzschlüssen stets die vorgeschriebene Spannungsquelle verwenden.

Vielen Dank für den Kauf der JVC-Farbvideokamera KY-210. Sie besitzen mit ihr eine äußerst kompakte und robuste Kamera, die für vielfältige Anwendungen bei Außen- und Innenaufnahmen konstruiert wurde. In Verbindung mit einem trabaren Videorekorder kann diese Kamera in nahezu jeder Aufnahmesituation verwendet werden.

Um alle Möglichkeiten dieser Kamera ausschöpfen zu können, empfehlen wir Ihnen, diese Bedienungsanleitung sorgfältig durchzulesen und bei auch später auftauchenden Fragen in dieser nachzuschlagen.

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BESONDERHEITEN

- **Hervorragendes Preis/Leistungsverhältnis mit einer Konzeption, die man bei ENG/EFP-Kameras vorfindet**
  Taktgeber nach PAL-B (mit Farbbildimpuls-Ausgang), variable H/V-Austastung, Genlock-Schaltung.
- **Kompakte, leichte und robuste Druckguß- Konstruktion für erhöhte Beweglichkeit und erleichterte Handhabung**
  Ein "Leichtgewicht" von nur 3,5 kg.
- **Hohe Bildqualität durch Prismen-Farbteiler und drei Saticon*-Aufnahmeröhren**
  Hohe Auflösung von 650 Linien, ein Videostörspannungsabstand von 54 dB und Minimalbeleuchtung von nur 40 Lux.
- **Zahlreiche automatische Funktionen zur Erleichterung der Handhabung und Kalibrierung**
  Automatische Rasterdeckung, Automatischer Weißwertabgleich, automatischer Schwarzwertabgleich, automatische Strahlstromregelung (ABC), automatische Schwarzwertregelung (ABL), automatische Servoregelung der Blende (NAM), automatischer Blendenverschluß.

Die Genlock-Schaltung erfordert eine stabile Eingangsquelle; die KY-210 kann nicht ohne Zeitfehlerausgleicher an einen Videorekorder mit Schrägspurabtastung gekoppelt werden.

* Eingetragenes Warenzeichen

VORSICHTSMASSNAHMEN

Allgemeine Sicherheitsmaßnahmen

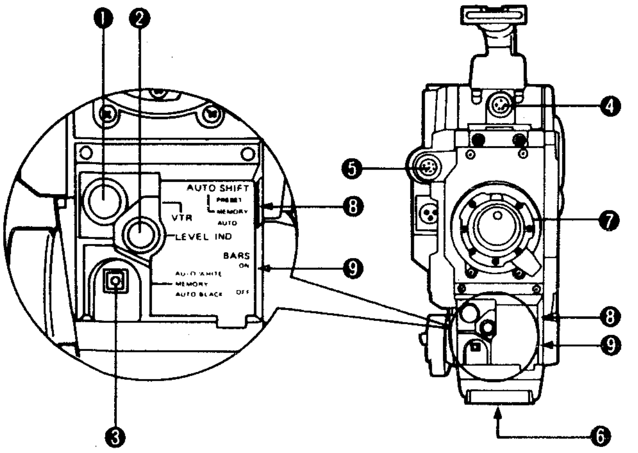
- Ausschließlich Batteriesätze DC-C50, bzw. DC-C19 oder Netzadapter AA-C50 (alle als Sonderzubehör erhältlich) verwenden.
- Keine entflammbaren oder metallischen Gegenstände oder Flüssigkeit in das Geräteinnere gelangen lassen, da ansonsten Fehlfunktionen hervorgerufen werden können.
- Am Gerät keine Umbauten vornehmen, und das Gerät niemals ohne Gehäusedeckel benutzen.
- Bei jeder Art von Störungsanzeichen (abnormale Geräusche, Geruch, Rauchentwicklung etc.) das Gerät sofort abschalten, und zu einem autorisierten JVC-Händler bringen.

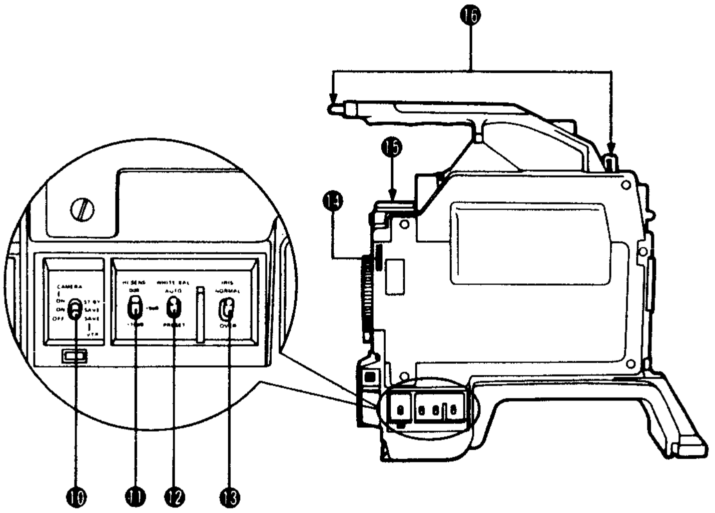
Sicherheitsmaßnahmen bei Betrieb

- **Betriebsspannung**
  Sichergehen, daß die Spannungsversorgung im Bereich zwischen 10,5 V und 15 V Gleichstrom liegt. Bei zu schwacher Spannungsversorgung kommt es zu Farbverfälschungen und verstärkten Rauschstörungen. Auf keinen Fall mehr als 15 V verwenden, da ansonsten das Gerät beschädigt werden kann.
- **Vorheizen**
  Das Gerät ist ca. 40 Sekunden nach Einschalten der Spannungsversorgung für normale Betriebsbedingungen ausreichend stabilisiert. Eine besser Stabilisierung ergibt sich jedoch erst nach Ablauf von 10 Minuten und darüber.
- **Schutz der Aufnahmeröhre**
  Das Objektiv niemals direkt auf Sonnenlicht oder andere sehr helle Lichtquellen richten, auch nicht auf Leuchtstofflampen, Reflektoren etc.; dies gilt auch für die nicht eingeschaltete Kamera, um jede Beschädigung der Aufnahmeröhre zu vermeiden. Bis zu Beginn der Aufnahme, bzw. der Aufnahmevorbereitungen das Objektiv stets abgedeckt halten.
- **Anschluß an einen tragbaren Videorekorder**
  Je nach Videorekorder-Modell sind unterschiedliche Verfahren und Kabel für die Start/Stop-Steuerung erforderlich. Daher vor Anschluß bitte den Abschnitt "Anschluß an einen Videorekorder" auf Seite 44 sorgfältig durchlesen.
- **Intercom-Kopfhörer**
  Wird der Empfänger eines Intercom-Kopfhörers zu nahe bei der Kamera plaziert, kann der Magnetismus Rasterdeckung und Farbabgleich beeinträchtigen. Deshalb den Kopfhörer niemals auf der Kamera ablegen.
- **Umgebungstemperatur**
  Die Betriebstemperatur der Kamera variiert in Abhängigkeit vom verwendeten Röhrentyp. Angaben hierzu finden sich im Abschnitt "Technische Daten" auf Seite 58. Im Bereich der zulässigen Höchsttemperaturen sollte die Betriebsdauer auf maximal eine Stunde eingeschränkt werden, um Schäden der Röhren zu vermeiden.
- In der Nähe starker elektromagnetischer Wellen oder Magnetfelder, z.B. von einem Transformator, Elektromotor etc., können Bildstörungen und Farbverfälschungen auftreten.
- Wird in der Nähe der Kamera ein drahtloses Mikrofon/ein drahtloser Mikrofonempfänger verwendet, können Störgeräusche im Empfänger auftreten. In diesem Fall einen anderen Kanal wählen.

BEDIENELEMENTE, ANSCHLÜSSE UND ANZEIGEN

Kamera-Gehäuse





① Videorekorder-Steuerschalter (VTR)
Für Start/Stopschaltung des Videorekorders. Bei Verwendung des Standard-Zoomobjektivs hat diese Taste die gleiche Funktion wie die VTR-Taste am Objektiv.

② Pegelanzeige -Schalter (LEVEL IND.) (Siehe Seite 55)
Für die Ein/Ausschaltung der Videopegelanzeige im Sucher.

③ Schalter für automatischen Weiß- und Schwarzwertabgleich
Automatischer Weißwertabgleich ist möglich, wenn der WHITE BAL.-Schalter ⑫ bei Aufnahme einer weißen Vorlage auf die Position "AUTO" eingestellt ist.

AUTO WHITE: Wird der Schalter in dieser Position gehalten, erfolgt der automatische Weißwertabgleich.
AUTO BLACK: Wird der Schalter in dieser Position gehalten, schließt sich die Blende, und es erfolgt der automatische Schwarzwertabgleich.
MEMORY: In dieser Schalterposition werden die oben genannten Einstellungen gespeichert.

④ Sucherbuchse (VF)
Wurde der als Sonderzubehör erhältliche Sucher auf den Sucherschuh ⑮ aufgeschoben, kann hier der Anschluß an die Kamera hergestellt werden.

⑤ Objektivbuchse (LENS)
Hier das Kabel des Standardobjektivs anschließen.

⑥ Stativanschluß

⑦ Objektiv-Anschlußring

⑧ Schalter für automatische Rasterdeckung (AUTO SHIFT)
PRESET: Für voreingestellte Rasterdeckung.
MEMORY: In dieser Schalterposition wird diese Einstellung gespeichert.
AUTO: Wird der Schalter in dieser Position gehalten, erfolgt bei Aufnahme eine automatische Zentriereinstellung der Rasterdeckung.

⑨ Farbbalkenschalter (BARS)
Wird der Schalter unter der Abdeckung auf Position "ON" gestellt, liegt am Videoausgang ein Farbbalkensignal an.

⑩ Betriebsschalter (CAMERA ON/ON/OFF, VTR ST-BY/SAVE/SAVE) (Siehe Seite 47)
Drei Positionen stehen zur Verfügung: Ein/Ausschaltung der Kamera-Spannungsversorgung und Batteriesparschaltung für Videorekorder.

⑪ Empfindlichkeitsschalter (HI-SENS)
Bei schwachen Lichtverhältnissen kann die Empfindlichkeit um +9 dB oder +18 dB angehoben werden. Im Normalfall sollte die Position "0 dB" eingestellt sein.

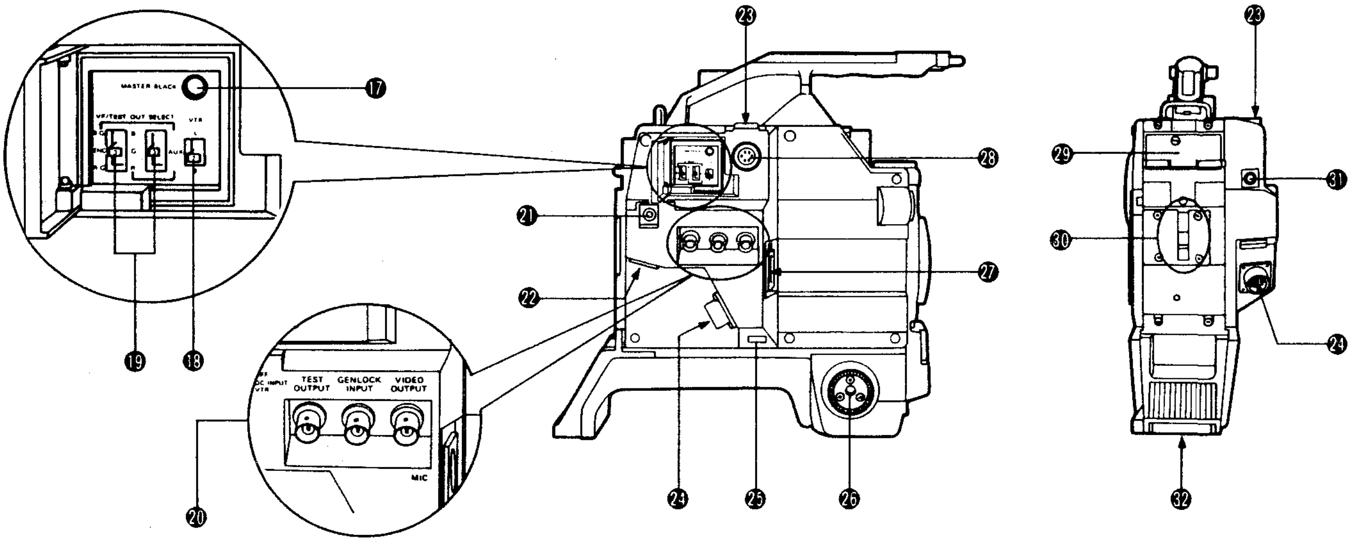
⑫ Schalter für Weißwertabgleich-Funktion (WHITE BAL.)
AUTO: Für automatischen Abgleich mit Schalter ③.
PRESET: Voreingestellter Farbtemperaturwert von 3200 K.

⑬ Blendenpegel-Schalter (IRIS) (Siehe Seite 48)
Für die Variierung des Standardpegels bei automatischer Blendenregelung.

⑭ Filterrad
Das Filterrad für Neutral- und Farbtemperaturfilter besitzt 4 Positionen.
1. CLOSE: Eintspricht dem abgedeckten Objektiv.
2. 3200 K: Für Außen- und Innenaufnahmen bei schwachen Lichtverhältnissen.
3. 5600 K: Für Außenaufnahmen.
4. 5600 K +25 % ND: Eine Kombination eines Neutralfilters mit 25 % Wirkung und dem 5600-K-Farbfilter für Außenaufnahmen unter sehr hellen Lichtbedingungen.

⑮ Sucherschuh
Für den als Sonderzubehör erhältlichen Sucher VF-215.

⑯ Schultergurt-Befestigungshaken
Für den mitgelieferten Schultergurt.



⑰ Schwarzwertregler (MASTER BLACK)

⑱ VTR-Wahlschalter (VTR)
(Siehe Seite 42)
Entsprechend der Start/Stop-Steuerschaltung des angeschlossenen Videorekorders einstellen.

⑲ Sucher- und Testausgangsignal-Wahlschalter (VF/TEST OUT SELECT) (Siehe Seite 39)
Zur Wahl des Signalausgangs der TEST OUTPUT-Buchse und des Suchers.

⑳ Signalbuchsen

Videoausgang (VIDEO OUTPUT)	: Hier liegt das FBAS-Signal an.
Genlock-Eingang (GENLOCK INPUT)	: Für Genlock-Betrieb der Kamera sollte an diese Buchse das FBAS- oder Black Burst-Signal extern gelegt werden.
Testausgang (TEST OUTPUT)	: Hier liegt das über den VF/TEST OUT SELECT-Schalter ⑲ gewählte Testsignal an.

㉑ Spannungs-Wahlschalter (POWER)
Mit diesem Schalter kann die Spannungsversorgung bestimmt oder komplett abgeschaltet werden.

RS:	Bei Verwendung der als Sonderzubehör erhältlichen Fernsteuerung RS-500 auf diese Position stellen.
OFF:	Die Spannungsversorgung der Kamera ist komplett abgeschaltet.
DC INPUT/VTR:	Die Spannungsversorgung erfolgt über die DC INPUT- ㉒ oder VTR-Buchse ㉔.

HINWEIS: Angaben zur zulässigen Spannungsversorgung vom Rekorder finden sich in dessen Bedienungsanleitung.

㉒ Buchse für Gleichstromversorgung (DC INPUT)
Diese 4-pol-XLR-Buchse ist für 12 V Gleichstromversorgung von Batteriesatz DC-C50 oder Netzadapter AA-C50 (beide als Sonderzubehör erhältlich) vorgesehen.

Stift-Nr.	Funktion
1	ERDE
2	
3	
4	+12 V

㉓ Mikrofon-Schuh

㉔ Videorekorder-Buchse (VTR)
Diese 14-pol-Buchse ist für den Anschluß eines tragbaren Videorekorders vorgesehen.

Stift-Nr.	Funktion	Stift-Nr.	Funktion
1	GLEICHSTROM (ERDE)	8	ERDE
2	GLEICHSTROM 12-V-EINGANG	9	VIDEOREKORDER-SIGNAL-EING.
3	MIK. (SPANN.FÜHREND)	10	BATTERIEANZEIGE-EING.
4	MIK. (OHNE SPANN.)	11	FARBBILDIMPULS-AUSG.
5	MIK. ABSCHIRMUNG	12	AUFNAHME/WARNSIGNAL-EING.
6	VIDEO-AUSG./EING. (SPANN.FÜHREND)	13	VIDEOREKORDER-START/STOP-SIGNAL-AUSG.
7	VIDEO-AUSG./EING. ABSCHIRMUNG	14	BATTERIESPAR-AUSG./AUDIOMONITOR-EING.

㉕ Mikrofonausgangspegel-Schalter (MIC LEVEL)
Der via VTR-Buchse ㉔ laufende Audio-Ausgangspegel kann in zwei Stufen geschaltet werden.
HIGH: Ca. -20-dB-Pegel.
LOW: Mikrofonausgangspegel.

㉖ Bruststützenverriegelung

㉗ Mikrofon-Eingangsbuchse (MIC INPUT)
Diese Buchse ist für den Anschluß von Mikrofonen mit 4-pol-XLR-Stecker vorgesehen. Der Eingang läuft parallel zur MIC-Buchse ㉘.

㉘ Exklusiv-Mikrofonbuchse (MIC) (Siehe Seite 43)
Für Anschluß des als Sonderzubehör erhältlichen Mikrofons M-K50. Die Spannungsversorgung für dieses Elektret-Kondensator-Mikrofon erfolgt über diese 6-pol-Buchse.

㉙ Anschluß für Fernsteuerung
Bei Verwendung der als Sonderzubehör erhältlichen Fernsteuerung RS-500 deren Kameraadapter hier anschließen. (Detaillierte Angaben befinden sich in der Bedienungsanleitung der RS-500.)

㉚ Batterie-Halterung
Batteriesatz DC-C50 oder DC-C19 (beide als Sonderzubehör erhältlich) können auf die Kamerarückseite aufgeschoben werden.

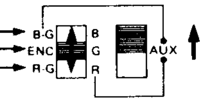
㉛ Kopfhörerbuchse (EARPHONE)
Liefert der verwendete tragbare Videorekorder ein Audiosignal zur Kamera, kann das Wiedergabe-Audiosignal über diese 3,6-mm-Minibuchse abgehört werden.

㉜ Stativanschluß

- **Wahlschalter für Sucher und Testausgang (VF/TEST OUT SELECT)**

Je eines der Signale ① bis ⑦ kann über den Sucher oder die TEST OUTPUT-Buchsen geliefert werden.

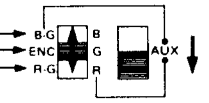
① ENC-Ausgang (Farbkodierer)
② B-G-Ausgang (für Rasterdeckungs-Check)
③ R-G-Ausgang (für Rasterdeckungs-Check)



Auf die obere Position einstellen.

Bei den hier oben gezeigten Einstellungen werden die Signale ① bis ③ geliefert.

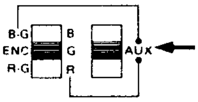
④ B-Kanal-Signalausgang
⑤ G-Kanal-Signalausgang
⑥ R-Kanal-Signalausgang



Auf die untere Position einstellen.

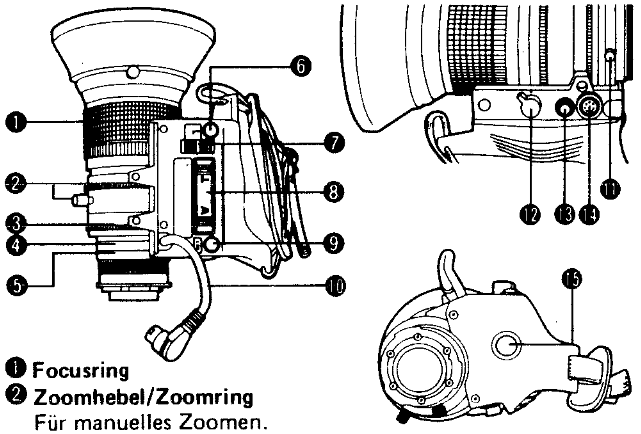
Bei den hier oben gezeigten Einstellungen werden die Signale ④ bis ⑥ geliefert.

⑦ AUX-Signalausgang
Dieses wird bei der rechts gezeigten Einstellung geliefert.



Auf die mittlere Position ("AUX") einstellen.

Zoom-Objektiv (Sonderzubehör HZ-510)



❶ **Focusring**

❷ **Zoomhebel/Zoomring**
Für manuelles Zoomen.

❸ **Blendenring**
Bei Position "M" des Blenden-Betriebsartenschalters ❼ kann die Blende mit diesem Ring manuell geöffnet und geschlossen werden.

❹ **Schnittweitenring**
Für die Justierung der Schnittweite.

❺ **Makroring**

❻ **Kurzzeit-Blendenschalter**
Auch bei manueller Blendenregelung, wenn der Blenden-Betriebsartenschalter auf Position "M" gestellt ist, kann auf automatische Blendenregelung umgeschaltet werden, solange diese Taste gedrückt gehalten wird.

❼ **Blenden-Betriebsartenschalter**
A: Für automatische Blendenregelung.
M: Für manuelle Blendenregelung.
R: Für Fernbedienbetrieb (mit Fernsteuerung RS-500)

❽ **Zoom-Servoschalter**
Mit diesem Wippschalter können Zoomrichtung und -geschwindigkeit geregelt werden.

❾ **Rekordersignal-Schalter (RET)**
Bei gedrücktem Schalter kann das vom Videorekorder kommende Videosignal im Sucher überwacht werden.

❿ **Objektivkabel**
Mit der LENS-Buchse des Kameragehäuses verbinden.

⓫ **Sicherungsknopf**
Für die Fixierung des Schnittweitenrings

⓬ **Zoom-Betriebsartschalter (ZOOM)**
S: Für Servozoomen
M: Für manuelles Zoomen.

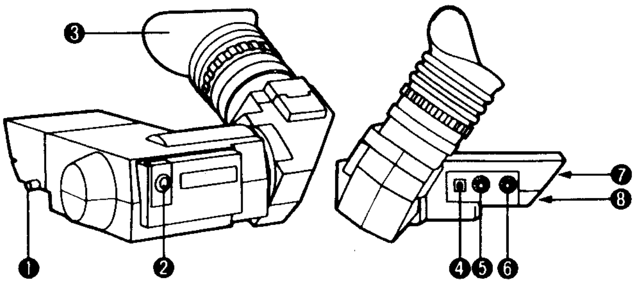
⓭ **Anschluß für Servo-Focussteuerung**

⓮ **Anschluß für Servo-Zoomsteuerung**

⓯ **Betriebsartenschalter für die Videorekorder-Steuerung**
Für die Start/Stop-Schaltung des Videorekorders.

> **HINWEIS:** Wird ein anderes als das als Sonderzubehör erhältliche Objektiv HZ-510 verwendet, kann das Bild am oberen und unteren Rand dynamische Abschattungen enthalten; in diesem Fall sind interne Einstellungen und eventuell eine Neu-Justierung der Schnittweite notwendig. Weitere Informationen sind bei einem Fachhändler erhältlich.

Sucher (Sonderzubehör VF-215)



❶ **Befestigungsschraube**
Für die Anbringung des Suchers am Kameragehäuse.

❷ **Rotlicht**
Ist die Kamera an einem trabaren Videorekorder angeschlossen, gibt diese LED bei Aufnahmebetrieb ein Leuchtsignal.

❸ **Okular**
Ein Dioptrie-Ausgleich ist vorhanden.

❹ **Spitzenwert-Schalter (PEAKING)**
Für die Verstärkung der Bildkonturen, um die Schärfeeinstellung zu erleichtern.

❺ **Kontrastregler (CONTRAST)**

❻ **Helligkeitsregler (BRIGHT)**

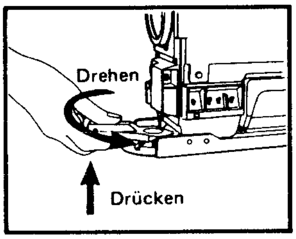
❼ **Sucher-Anschluß**
Der Anschluß wird bei Anbringung des Suchers am Kameragehäuse hergestellt.

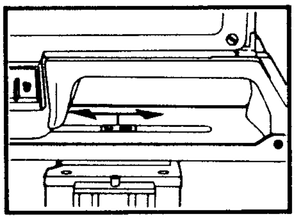
❽ **Sucherfuß**

ANBRINGUNG VON ZUBEHÖR

Anbringung an einem Stativ (Mit Stativadapter KA-500)

1. Der Stativadapter besitzt 1/4"- und 3/8"-Gewindeöffnungen; die geeignete Öffnung benutzen.
2. Die Kamera am Stativadapter befestigen (wobei sich der Adapterhebel unter der Kamera-Frontseite befinden muß). Die Befestigung sichern, indem der Hebel bei gedrücktem Verriegelungsknopf in Richtung Einrastkerbe bewegt und in dieser arretiert wird.
3. Die Gewindeöffnungen des Stativadapters können vor-/rückwärts verschoben werden. Zur Ausbalancierung der Kamera die Stativschraube lösen, die Kamera auf die erforderliche Position verschieben, und die Schraube wieder festziehen.

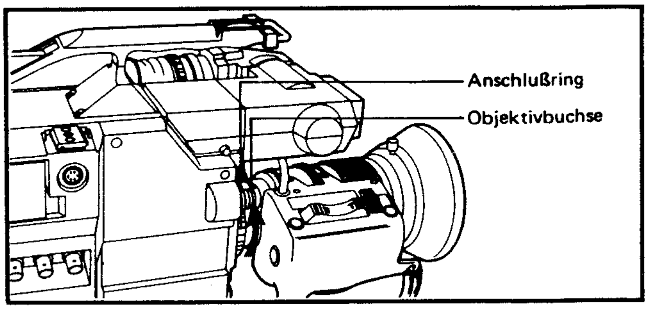




HINWEIS: Bei Abnahme der Kamera vom Stativ den Hebel des Stativadapters nicht zu heftig bewegen, damit die Kamera nicht herunterfällt. Den Hebel stets langsam umlegen, und dabei die Kamera mit der anderen Hand halten.

Anbringung des Objektivs (Sonderzubehör HZ-510)

– Vor Anbringen/Abnehmen des Objektivs das Filterrad auf Position 1 ("CLOSE") stellen.

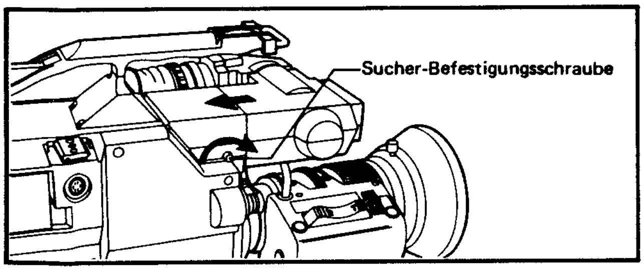


1. Die Kappe am Objektiv-Anschlußring abnehmen; dabei darauf achten, daß kein Staub etc. in die Öffnung eindringt.
2. Den Stift am Objektiv auf die Nut am Anschlußring ausrichten, und dann den Anschlußring im Uhrzeigersinn drehen, bis Objektiv und Anschlußring fest miteinander verbunden sind.
3. Das Objektivkabel am Kameragehäuse anschließen.

HINWEIS: Sichergehen, daß das Objektiv korrekt angebracht wird; andernfalls kann die Schnittweiteneinstellung ungenau sein.

Anbringung des Suchers (Sonderzubehör VF-215)

1. Den Sucher von vorne auf die Kamera-Frontseite aufschieben, wobei die Nut am Sucher auf den Sucherschuh der Kamera ausgerichtet werden muß.
2. Wenn der Sucher festen Kontakt hat, die Sucher-Befestigungsschraube mit einem Schraubenzieher festziehen.



Betriebsartensteuerung des Videorekorders

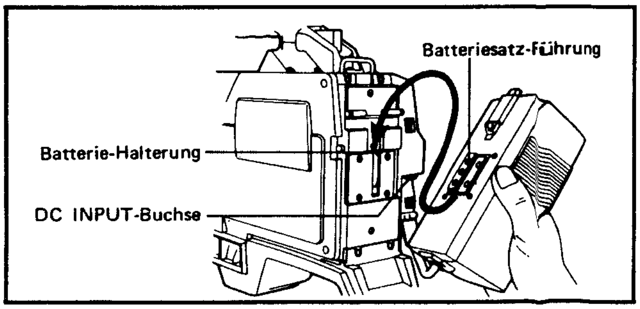
Der VTR-Wahlschalter erlaubt die Umschaltung des Videorekorder-Start/Stop-Signals, je nach Videorekorder. Den Schalter entsprechend der folgenden Tabelle einstellen.

Schalterposition	Rekorder-Buchse	Steuer-Art
L	10-pol	Erdungskontakt
B	14-pol	+4 V-Kontakt

HINWEIS: Der VTR-Wahlschalter wird ab Werk auf Position "B" eingestellt.

Anbringung des Batteriesatzes (Sonderzubehör DC-C50)

1. Die Führung des Batteriesatzes an die Batteriehalterung ㉚ andrücken und nach unten schieben, bis der Satz einrastet.
2. Den Batteriesatz-Stecker an die DC INPUT-Buchse ㉒ der Kamera anschließen.



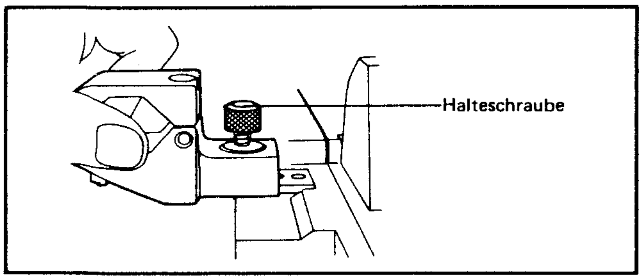
Betrieb mit Batteriesatz

- Mit einem voll aufgeladenen Batteriesatz DC-50 sind bei normalen Umgebungstemperaturen (ca. 25°C) ca. 60 Minuten Kamerabetrieb möglich.
- Sichergehen, daß der Batteriesatz vor Aufnahmebetrieb geladen wird. Es ist empfehlenswert, Ersatz-Batteriesätze bereitzuhalten.
- Wenn die BATT-Anzeige (rot) im Sucher ein Blinksignal gibt, den Batteriesatz auswechseln.
- Zum Aufladen des Batteriesatzes sollte der als Sonderzubehör erhältliche Netzadapter AA-C50 verwendet werden. Angaben zum Ladevorgang finden sich in der Bedienungsanleitung des AA-50.

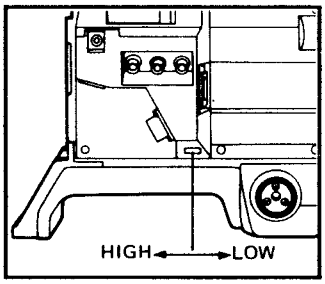
Anbringung von Mikrofonen

– Mikrofone können unter Verwendung der mitgelieferten Mikrofonhalterung am Kameragehäuse angebracht werden.

1. Die Mikrofonhalterung am Mikrofonhalterungsschuh, der sich links oben an der Kamera befindet, anbringen und mit der Halteschraube sichern.
2. Das Mikrofonkabel an die 3-pol-MC INPUT-Buchse am Kameragehäuse anschließen.

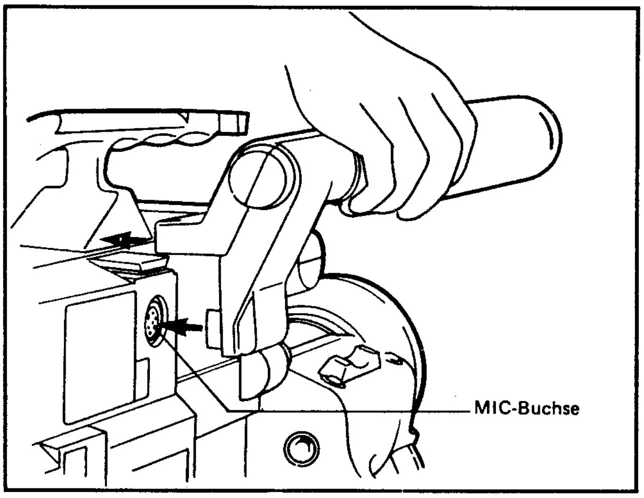

Halteschraube

Mikrofon-Ausgangspegel
Der Mikrofon-Ausgangspegel kann auf Position "HIGH" (ca. -20 dB) und "LOW" (durchgeschalteter Ausgang).



Exklusiv-Mikrofon (Sonderzubehör M-K50)
Mikrofon M-K50 kann direkt auf das Kameragehäuse aufgesteckt werden. Die 6-pol-Buchse besitzt die in der nebenstehenden Tabelle gezeigte Pol-Anordnung.

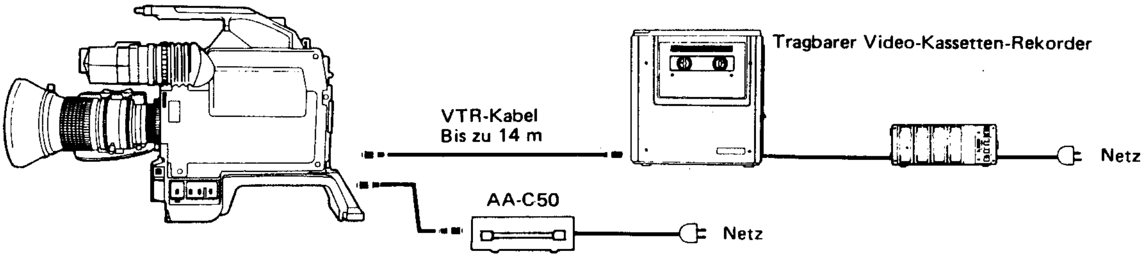
Pol-Nr.	Funktion
A	NICHT BELEGT
B	+9-V-AUSGANG
C	ERDE
D	MIK. (SPANN. FÜHR.)
E	MIK. (OHNE SPANN.)
F	ERDUNGS-ABSCHIRMUNG



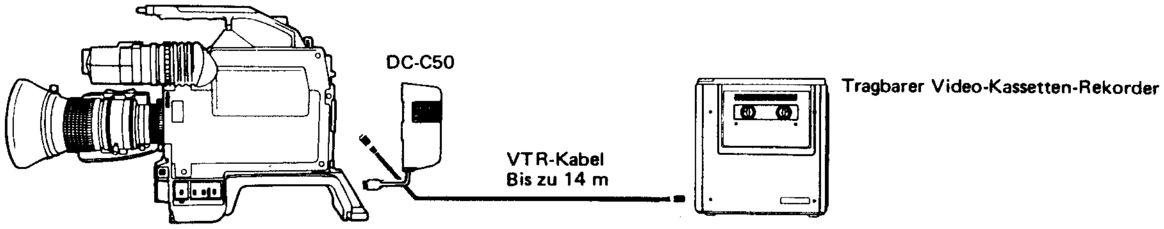
ANSCHLUSS AN EINEN VIDEOREKORDER

Betrieb bei Netzanschluß

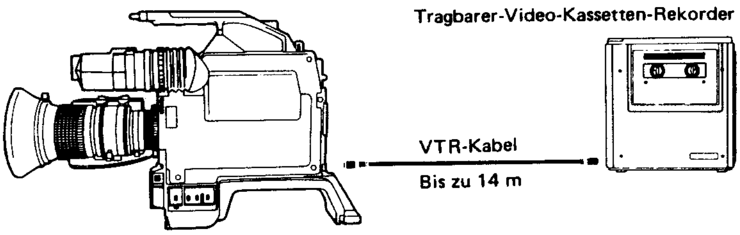
KY-210 und AA-C50 sind optimal auf den Betrieb mit tragbaren Videorekordern von JVC abgestimmt. Die unten gezeigten Anschlüsse sind bei Betrieb mit einigen Videorekordern anderer Hersteller nicht anwendbar. Vor Anschluß sollten daher Informationen bei einem Fachhändler eingeholt werden.


Tragbarer Video-Kassetten-Rekorder
VTR-Kabel
Bis zu 14 m
Netz
AA-C50
Netz

Betrieb mit Batteriesatz (Sonderzubehör DC-C50)


DC-C50
Tragbarer Video-Kassetten-Rekorder
VTR-Kabel
Bis zu 14 m

Betrieb bei Spannungsversorgung von einem tragbaren Videorekorder

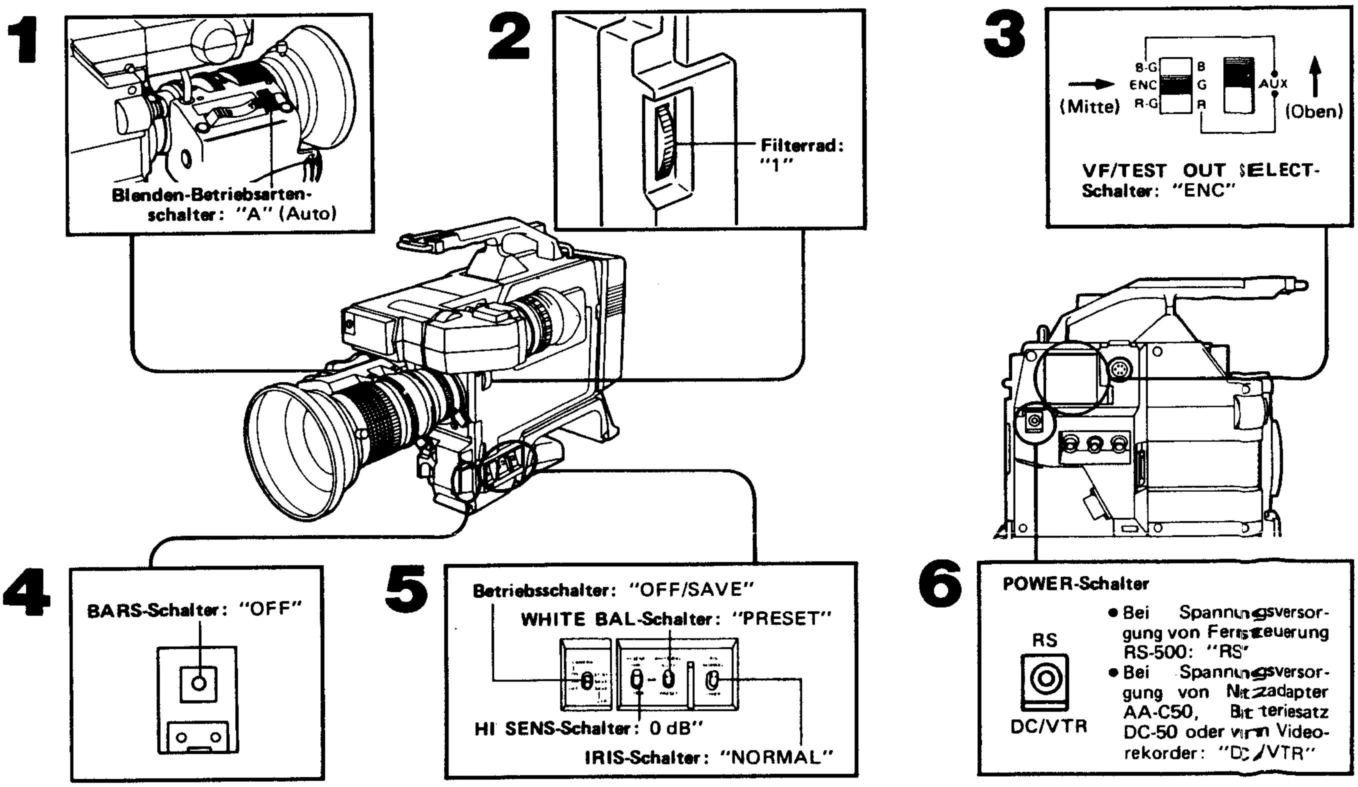


HINWEIS: Wird die Kamera über die Rekorder-Batterie gespeist, ist der Betrieb aufgrund der eingeschränkten Batterie-Kapazität möglicherweise nicht oder nur über einen sehr kurzen Zeitraum durchführbar. Die Spannungsversorgung der Kamera sollte nicht über der zulässigen Stromleistung des Rekorders liegen.

Angeschlossener Videorekorder	VTR-Kabel, 2 m (Verlängerung 10 m)	Steuerung	Mikrofonpegel	Audio-Überwachung	Warnanzeigen	
					Kamera/Rekorderbatterie	Bandende/Servostörung
CR-4400	VC-511B-2 (VC-582B)	L	H: -20 dB	X	O/X	X
HR-C3	VC-511B-2 (VC-582B)	L	H: -20 dB	O	O/O	X
BR-6200	VC-511B-2 (VC-582B)	L	H: -20 dB	X	O/X	X
CR-4700	VC-512B-2 (VC-589B)	B	L: -52 dBm o. H: -20 dB	O	O/O	O

O: Möglich
X: Nicht möglich

VORBEREITUNG



1. Blenden-Betriebsarten-schalter: "A" (Auto)
2. Filterrad: "1"
3. VF/TEST OUT SELECT-Schalter: "ENC"
4. BARS-Schalter: "OFF"
5. Betriebsschalter: "OFF/SAVE"
   WHITE BAL-Schalter: "PRESET"
   HI SENS-Schalter: 0 dB"
   IRIS-Schalter: "NORMAL"
6. POWER-Schalter
   - Bei Spannungsversorgung von Fernsteuerung RS-500: "RS"
   - Bei Spannungsversorgung von Netzadapter AA-C50, Batteriesatz DC-50 oder vom Videorekorder: "DC/VTR"

Um ein klares Bild mit korrekter Farbwiedergabe zu erzielen, ist die Regelung von Weiß- und Schwarzwertabgleich sowie der Rasterdeckung erforderlich. Vor diesen Regelungen diese Schalter wie folgt einstellen.

1. Den OPERATE-Schalter auf "ON/SAVE" stellen.
   - Strahlstrom fließt in die Aufnahmeröhren und die Blende wird geöffnet.
   - Der OPERATE-Schalter besitzt die drei folgenden Positionen. In Verbindung mit einigen Rekordermodellen ist bei Verwendung der "SAVE"-Positionen Batteriesparbetrieb möglich.

Schalterposition	**Kamerastatus**	**Rekorderstatus**	
		14-pol-Rekorder	**10-pol-Rekorder**
ON/ST BY	Eingeschaltet	Betriebsbereit	Betriebsbereit
ON/SAVE	Eingeschaltet	Batteriespar.	Betriebsbereit
OFF/SAVE	Abgeschaltet	Batteriespar.	–

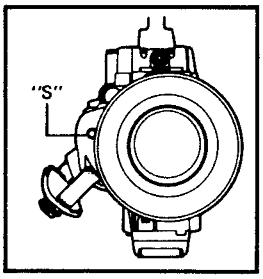
2. Zur Erzielung von farbechten Bildern das Filterrad den Beleuchtungsbedingungen entsprechend einstellen.

Rad-position	**Einstellung**	**Bedingungen**
1	CLOSE	Bei Nichtverwendung der Kamera
2	3200 K	Studiobeleuchtung, Außenaufnahmen bei Sonnenaufgang/-untergang
3	5600 K	Außenaufnahmen bei trübem oder regnerischem Wetter
4	5600 K + 25 % ND	Außenaufnahmen bei klarem Wetter

3. Die Kamera auf ein normales Motiv richten, scharfstellen und das Sucherbild einstellen.
   - Die BRIGHT- und CONT-Regler des Suchers einstellen.
   - Eine blinkende BATT-Anzeige (rot) signalisiert eine nahezu erschöpfte Batterie; diese durch eine frische, voll aufgeladene ersetzen.

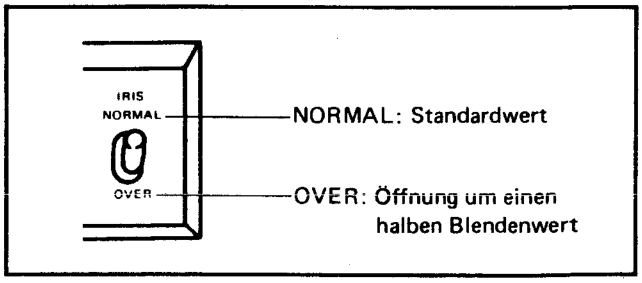
BLENDENREGELUNG

- Wenn der Blenden-Betriebsartenschalter (A/M) auf Position "A" gestellt wird, ist bei Objektiv HZ-510 keine Blendeneinstellung erforderlich.
  Die Blende schließt sich in den folgenden Fällen automatisch:
  1) Wenn der BARS-Schalter auf Position "ON" gestellt ist.
  2) Wenn der Betriebsschalter auf Position "OFF/SAVE" gestellt ist.
  3) Wenn der Schalter für automatischen Weiß/Schwarzwertabgleich während des Schwarzwertabgleichs in der Position "AUTO BLACK" gehalten wird.
- Bei einigen Objektiven kann es bei der Blendenautomatikfunktion zu Bildverzerrungen aufgrund von Über-/Unterbelichtungen kommen. In solchen Fällen Potentiometer "S" am Objektiv entsprechend den folgenden Bedienschritten einstellen.
  1. Den Blenden-Betriebsartenschalter (A/M) auf die Automatik Position "A" stellen.
  2. Die Beleuchtung so arrangieren, daß die Blende auf einen Wert von 5,6 eingestellt ist.
  3. Die Linse verschließen, so daß kein Licht mehr einfallen kann. (Die Blende öffnet sich vollständig.)
  4. Die Abdeckung wieder entfernen. Falls der Blendenwert 5,6 nicht stabil eingehalten wird, Potentiometer "S" justieren.



5. Die Blendenfunktion überprüfen, wobei der HI-SENS-Schalter auf Position "+9 dB" sowie "+18 dB" gestellt sein muß. Falls weiterhin Bildverzerrungen auftreten, Schritte 2 bis 4 wiederholen.

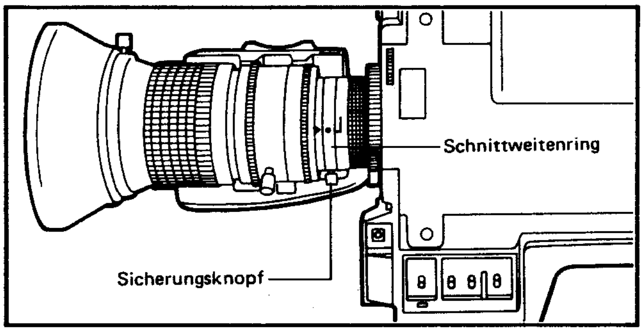
- Bei manueller Blendenregelung erscheint im Sucherbildschirm ein Zebradisplay, wenn der LEVEL IND-Schalter auf Position "ON" gestellt ist; Videopegel zwischen 90 und 100 % werden durch Streifen angezeigt. Als Referenzdisplay verwendbar.
- Bei automatischer Blendenregelung kann der IRIS-Schalter zu Belichtungskorrekturen verwendet werden, wenn das Aufnahmeobjekt im Verhältnis zum durchschnittlichen Bildpegel dunkler (oder heller) ist.



FEINREGULIERUNG DER SCHNITTWEITE

Bei Objektiv HZ-510 kann die Schnittweite am Objektivgehäuse reguliert werden. Vor der Regulierung sichergehen, daß das Objektiv fest am Kameragehäuse angebracht ist.

1. Eine Rasterdeckungs-Vorlagekarte bei voll geöffneter Blende aufnehmen (bei manueller Blendenregelung).
2. Bei zu hellen Lichtbedingungen den Lichteinfall verringern oder den Standort wechseln.
3. Bei Betrachtung des G-Signals im Sucher einzoomen und scharfstellen.
4. Auf die Weitwinkelposition auszoomen, den Sicherungsknopf durch Drehen im Gegenuhrzeigersinn lösen, und den Schnittweitenring drehen, bis die Schnittweite optimal eingestellt ist.

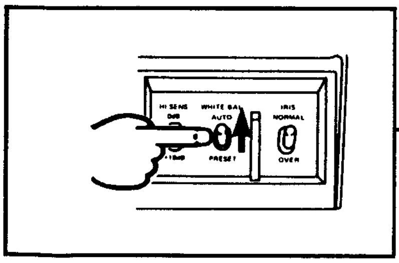

Schnittweitenring
Sicherungsknopf

5. Diesen Vorgang zur Feinregulierung mehrmals wiederholen.
6. Nach der Justierung den Sicherungsknopf wieder festziehen.

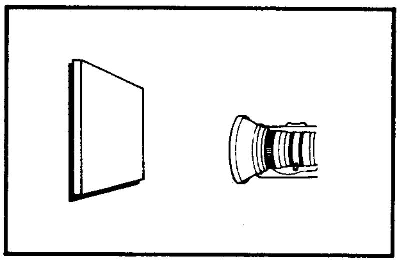
HINWEIS: Die Schnittweitenregulierung ist akkurater, wenn die Entfernung zwischen Aufnahmegegenstand (Vorlagekarte) und Kamera mehr als 3 m beträgt.

WEISSWERTABGLEICH

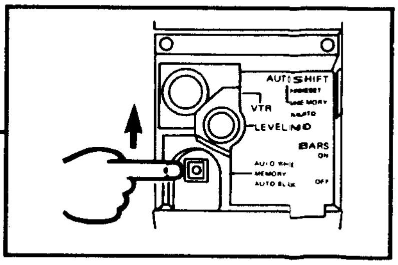
1 Den WHITE BAL-Schalter auf "AUTO" stellen.

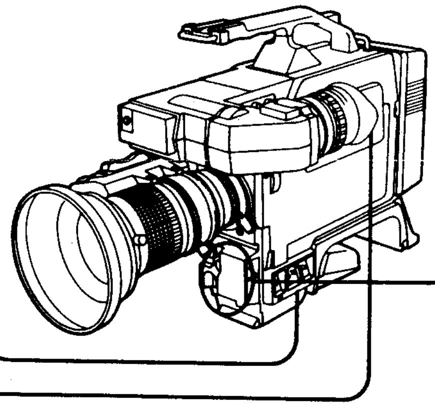

HI SENS
WHITE BAL
AUTO
PRESET
IRIS
NORMAL
OVER

2 Eine weiße Vorlage (Stoff, Wand etc.) sucherbildfüllend aufnehmen.

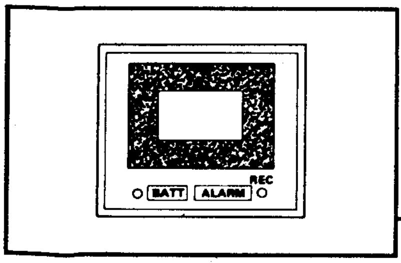


3 Den Schalter für automatischen Weiß- und Schwarzwertabgleich nach oben drücken und in der Position "AUTO WHITE" halten.

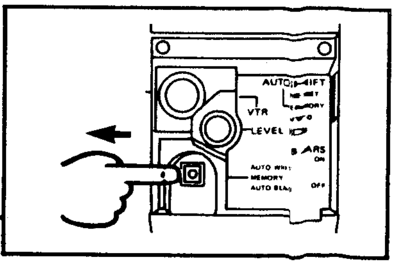

AUTO SHIFT
MEMORY
AUTO
VTR
LEVEL
BARS
ON
OFF
AUTO WHI
MEMORY
AUTO BLK



4 Im Sucherbildschirm erscheint ein weißes Viereck, bis der Abgleich beendet ist, und erlischt dann wieder.

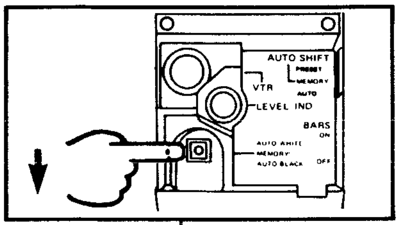

REC
BATT
ALARM

5 Den Schalter loslassen. Der mit diesem Weißwertabgleich erzielte Korrekturwert wird gespeichert.

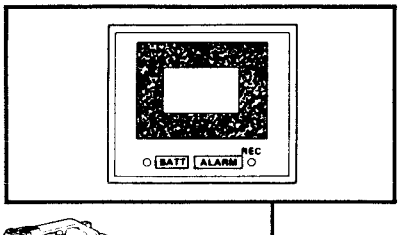

AUTO SHIFT
MEMORY
AUTO
VTR
LEVEL
BARS
ON
OFF
AUTO WHI
MEMORY
AUTO BLK

SCHWARZWERTABGLEICH

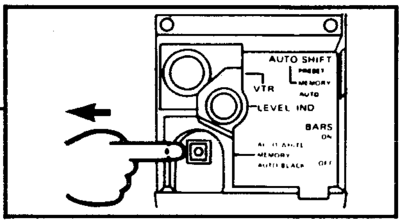
1 Den Schalter für automatischen Weiß- und Schwarzwertabgleich nach unten drücken und in der Position "AUTO BLACK" halten.

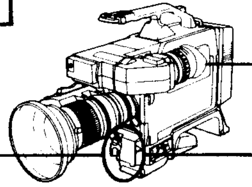


2 Im Sucherbildschirm erscheint ein weißes Viereck, bis der Abgleich beendet ist, und erlischt dann wieder.



3 Den Schalter loslassen. Der mit diesem Schwarzwertabgleich erzielte Korrekturwert wird gespeichert.





4 Hierauf den Weißwertabgleich wie auf der vorhergehenden Seite beschrieben nochmals durchführen. Damit ist der Weiß- und Schwarzwertabgleich abgeschlossen.

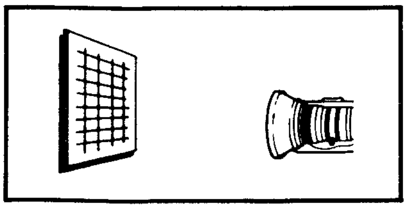
HINWEISE:

- Der Speicher für Weiß- und Schwarzwertabgleichsdaten wird von einer Knopfzelle gespeist, die von der Spannungsversorgung der Kamera unabhängig ist. Die Speicherdaten bleiben bis zur Erschöpfung oder dem Auswechseln der Batterien erhalten. (Wenden Sie sich bitte an Ihren nächsten JVC-Fachservice, wenn die Knopfzelle ausgetauscht werden muß).
- Auch wenn die Blendenregelung auf "MANU" gestellt ist, schließt sich die Blende bei Schwarzwertabgleich automatisch und bleibt auch nach Beendigung dieses Vorgangs geschlossen.
- Erlischt das weiße Viereck bei Durchführung der Weißbalance nicht, obwohl der Schalter nach oben gedrückt gehalten wird, liegt womöglich der Farbtemperaturwert außerhalb des Regelbereichs oder die Lichtverhältnisse sind nicht ausreichend. In diesem Fall den Farbfilter umstellen oder die Beleuchtung erhöhen.
- Bei Aufnahmebetrieb unter wechselnden Lichtbedingungen, Farbfilter sowie Weiß- und Schwarzwertabgleich stets neu einstellen.

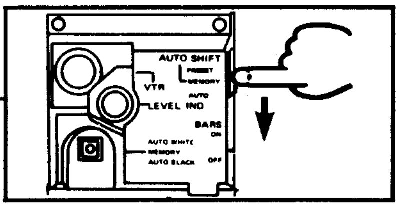
RASTERDECKUNG (AUTOMATISCHE RASTERDECKUNG)

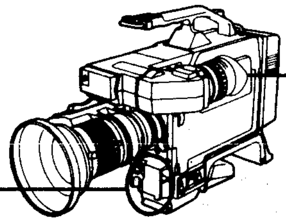
Die Deckungs-Schaltung der KY-210 verfügt über einen Automatik-Rasterdeckungs-Schaltkreis. Die Deckungseinstellung unter Verwendung der Automatikfunktion erfolgt entsprechend den folgenden Bedienschritten. Vor dieser Einstellung sollte der Weiß- und Schwarzwertabgleich erfolgen.

1 Einen schwarzweißen Gegenstand mit klaren Linien oder Umrissen (ein Rasterfeld, Schachbrettmuster etc.) sucherbildfüllend aufnehmen.

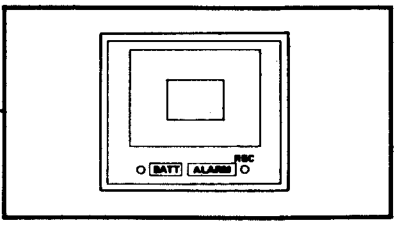


2 Den AUTO SHIFT-Schalter nach oben drücken und in der Position "AUTO" halten.





3 Im Sucherbildschirm erscheint das unten gezeigte Zeichen, bis die Einstellung beendet ist, und erlischt dann wieder.



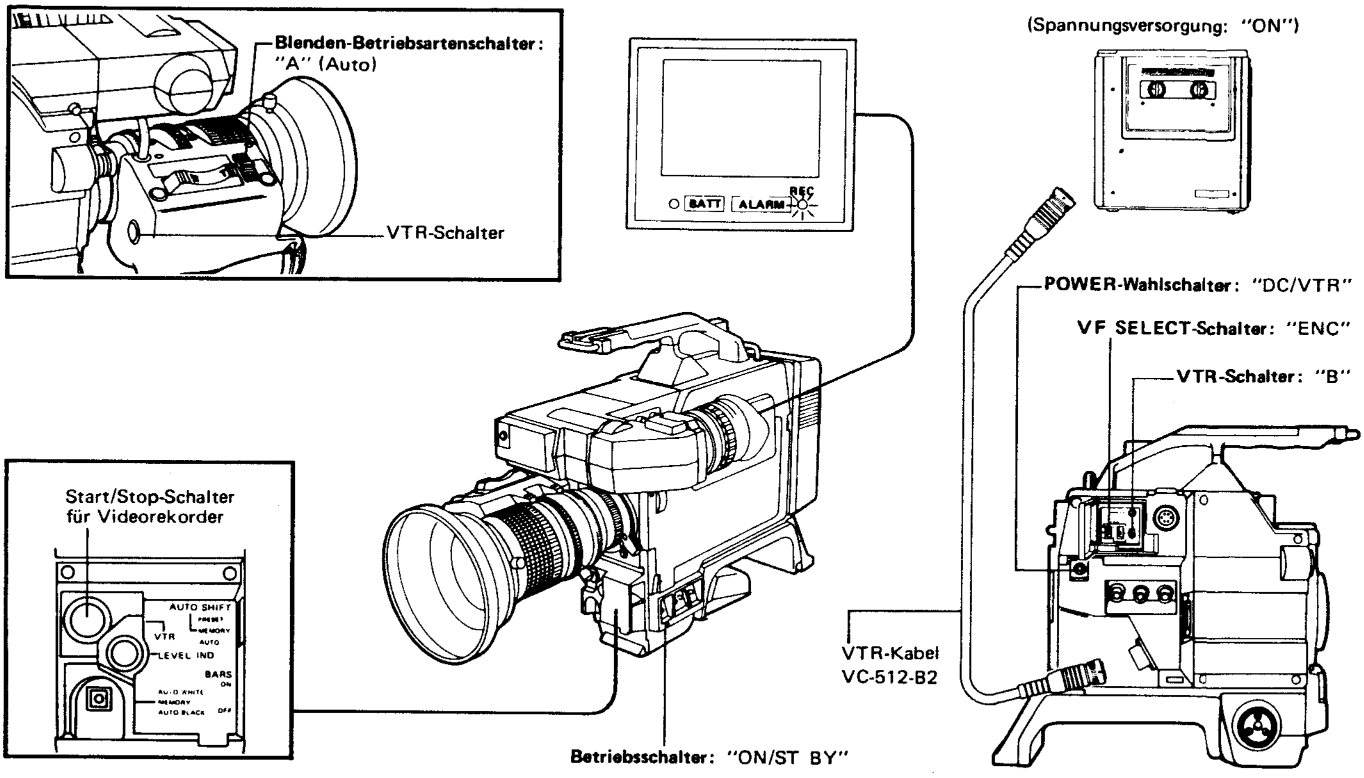
4 Den Schalter loslassen. Der mit der Einstellung erzielte Wert wird automatisch gespeichert.

- **Geeignete Vorlage**
  Um die Einstellung der Rasterdeckung korrekt durchzuführen, wird die Verwendung des mitgelieferten Vorlagemusters empfohlen.

HINWEISE:

- Bei dieser Einstellung die Entfernung zwischen Vorlage und Kamera so wählen, daß eine normale Zoomposition (keine Tele- oder Weitwinkelposition) verwendet werden kann.
- Erlischt das Zeichen nicht, obwohl der AUTO SHIFT-Schalter nach unten gedrückt gehalten wird, die Überprüfung der folgenden Punkte nochmals durchführen.
  1) Ist die Blende korrekt eingestellt (insbesonders bei manueller Blendenregelung)?
  2) Ist die Entfernung korrekt eingestellt?
  3) Besitzt die Vorlage zu wenige Kanten/Linien oder ist diese farbig?

AUFNAHME – Unter Verwendung eines tragbaren Videorekorders (JVC CR-4700) –


Blenden-Betriebsartenschalter: "A" (Auto)
VTR-Schalter
O BATT ALARM REC
(Spannungsversorgung: "ON")
POWER-Wahlschalter: "DC/VTR"
VF SELECT-Schalter: "ENC"
VTR-Schalter: "B"
Start/Stop-Schalter für Videorekorder
AUTO SHIFT
PRESET
MEMORY
AUTO
VTR
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF
VTR-Kabel VC-512-B2
Betriebsschalter: "ON/ST BY"

Vor der Aufnahme

1. Einen Videorekorder entsprechend den Anleitungen unter Abschnitt "Anschluß an einen Videorekorder" anschließen.
2. Die betreffenden Schalter wie auf der vorherigen Seite beschrieben einstellen.
3. Den automatische Weiß- und Schwarzwertabgleich durchführen.
4. Den Videorekorder auf Aufnahmebetrieb stellen.
5. Bei Bandtransport-Start den VTR-Schalter am Objektiv drücken.
   – Damit ist der Videorekorder auf Aufnahmepause geschaltet.

   Mit diesem Bedienschritt sind die Vorbereitungen abgeschlossen.

Aufnahme

1. Zum Aufnahmestart den VTR-Schalter am Objektiv betätigen.
   – Die REC-Anzeige (grün) im Sucher leuchtet.
2. Zur Überwachung des Wiedergabe-Videosignals vom Videorekorder den RET-Schalter am Objektiv betätigen.
   – Bei Anschluß der Kamera an ein stationären Videorekorder muß in einigen Fällen die Start/Stop-Funktion vom Rekorder aus gesteuert werden.
3. Zur Tonüberwachung des Mikrofonsignals die EAR PHONE-Buchse an der linken Seite des Kameragehäuses benutzen.
4. Bei interner Synchronisation der Kamera kann die KY-210 einen Farbbildimpuls via 14-pol-VTR-Buchse an den Videorekorder liefern. Bei externem Genlock-Betrieb ist der Farbbildimpuls automatisch abgeschaltet.

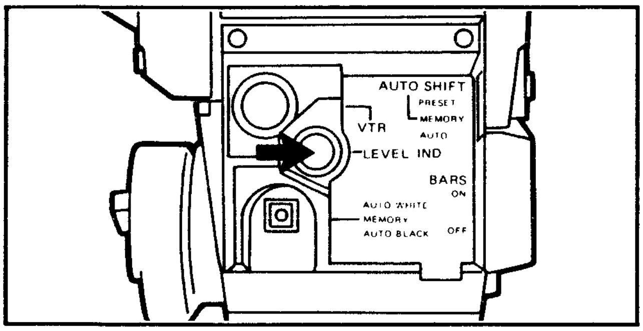
●●

Bei Bedienung des Videorekorders die Angaben in dessen Bedienungsanleitung beachten.

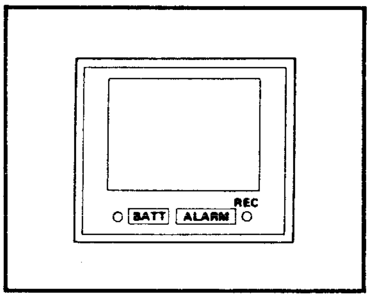
●●

AUSSTATTUNGSMERKMALE VON SUCHER VF-215

Videopegelanzeige
Mit dem als Sonderzubehör erhältlichen Sucher VF-215 werden 90 bis 100 % des Videopegels in Streifen angezeigt. Dieses Zebramuster erscheint nur bei Position "ENC" des VF/TEST OUT SELECT-Schalters, nicht in Schalterposition "REG", "R", "G" und "B".
Diese Videopegelanzeige ist als Referenz bei manueller Blendenregelung vorgesehen.
Bei Betätigen des LEVEL IND-Schalters wird die Anzeige alternierend ein- und abgeschaltet.



Warnanzeige
Der Sucher verfügt über zwei LED-Anzeigen, die für Warnfunktionen während der Aufnahme vorgesehen sind.



BATT-Anzeige (rot)
Die rote LED blinkt bei nahezu erschöpfter Kamera- oder Rekorderbatterie (bei einigen Rekordermodellen).
REC-Anzeige (grün)
Die grüne LED leuchtet bei Aufnahmebetrieb, zusammen mit der Front-Rotlichtanzeige.
ALARM-Anzeige (grün)
Die grüne LED blinkt bei Servo-Störungen oder bei Erreichen des Bandendes (bei einigen Rekordermodellen).

HINWEIS: Die obigen Warnfunktion arbeiten in Abhängigkeit vom verwendeten Videorekorder. Angaben zu den jeweils möglichen Anzeigen finden sich in den Bedienungsanleitung des verwendeten Videorekorders.

Sind Kamera und Videorekorder über ein VTR-Kabel verbunden, kann das Videosignal des Rekorders im Sucher wie unten gezeigt, überwacht werden. Die Wiedergabe-Bildüberwachung erlaubt eine sofortige Kontrolle einer gerade beendeten Aufnahme. Das überwachte Bild ist je nach Stellung des VF/TEST OUTPUT-Schalters und des verwendeten Rekordermodells unterschiedlich.

Videorekorder-Modell		**Kamerabild**	**Rekorderwiedergabe**
10-pol	CR-4400	Bei Schalterposition "ENC" erfolgt automatische Umschaltung.	
	HR-C3		
	BR-6200		
14-pol	CR-4700	ENC	RET*

* RET: Überwachung ist nur bei gedrücktem RET-Schalter möglich. Da die Hinterbandkontroll-Funktion des tragbaren Video-Kassetten-Rekorders CR-4700 wie normale Rekorderwiedergabe registriert wird, kann diese gleichfalls nur bei gedrücktem RET-Schalter erfolgen.

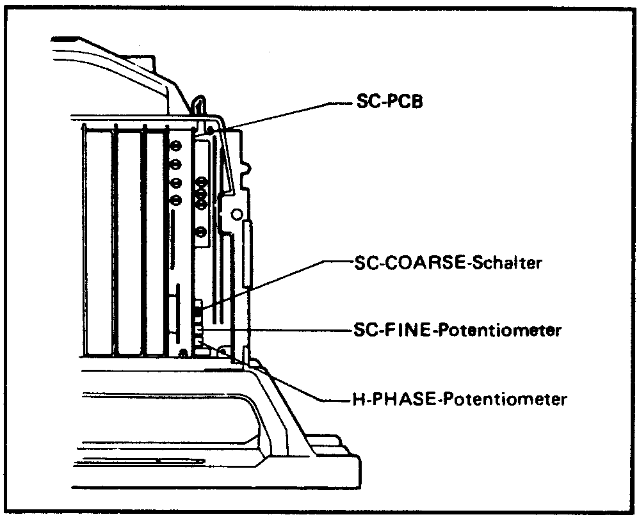
- Zu Bedienschritten für den Rekorder-Wiedergabebetrieb siehe dessen Bedienungsanleitung.

GENLOCK-BETRIEB

Genlock-Betrieb ist mit dem FBAS- oder Black Burst-Signal, das an die GENLOCK INPUT-Buchse angelegt wird, möglich. Die Phase des FBAS-Ausgangssignals der Kamera kann dem Referenz-Eingangssignal entsprechend innerhalb der im folgenden gezeigten Bereiche variiert werden.
Horizontale Sync: +3 bis -0,5 µs
Farb-Sync: 360°

Bedienschritte für die Phasenregelung

1. Die rechte Kameragehäuse-Abdeckung abnehmen.



2. Die folgenden Regler einstellen.
   Horizontal-Sync-Phase: H PHASE-Potentiometer
   Farb-Sync-Phase: SC FINE-Potentiometer (±60°)
   SC COARSE-Schalter (0°/120°/240°)

HINWEIS: Das Videorekorder-Wiedergabesignal kann nicht für Genlock-Betrieb verwendet werden. Wenn das Rekorder-Wiedergabesignal als Referenzsignal verwendet werden soll, muß das Signal mit einem Zeitfehlerausgleicher etc. korrigiert werden.

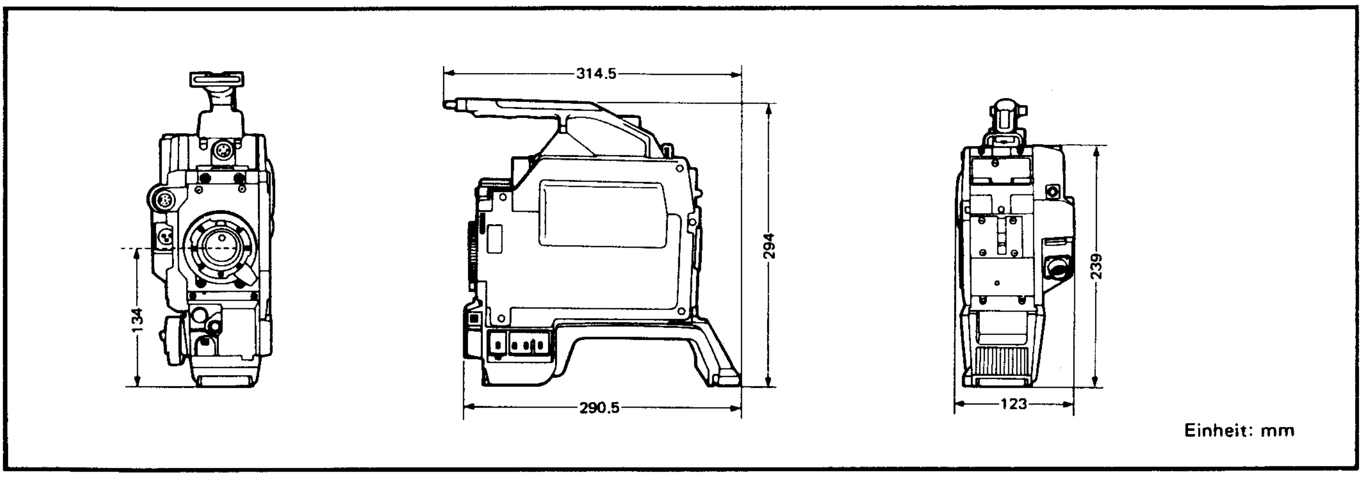
TECHNISCHE DATEN

Farb-Video-Kamera KY-210

Optisches System	: f/1,4 Dreiröhren-RGB-Prismensystem (mit Quarzfilter)
Objektivanschluß	: Bajonett
Optischer Filter	: Geschlossen, 3200 K, 5600 K, 5600 K + 25 % ND
Aufnahmeröhren	: 2/3"-Saticon* H4101 Elektrostatische Fokussierung/ elektromagnetische Ablenkung
Empfindlichkeit	: f/4 bei 2000 Lux
Störspannungsabstand	: 57 dB (NTSC -4.2 MHz Bandbreite)/ 54 dB norminal (PAL -5 MHz Bandbreite) Gamma; 1 Konturkorrektur; ausgeschaltet
Empfindlichkeits-Umschaltung	: 0 dB, +9 dB, +18 dB
Minimalbeleuchtung	: f/1,6, 40 Lux (+18 dB-Schalter ON)
Rasterdeckung	: Zone 1: Innerhalb 0,1 % (Kreis 80 % der Bildhöhe) Zone 2: Innerhalb 0,2 % (Kreis Bildbreite) Zone 3: Innerhalb 0,4 % (Fläche außerhalb von Zone 2)
Horizontal-Auflösung	: 650 Linien (Mitte G-Kanal)
Konturkorrektur	: Horizontal: Beidseitig Vertikal: 2 H (mit Kammfilter)
Coder	: NTSC (I, Q)/PAL-B (U, V mod.)
Matrix-Maskierung	: Vorhanden
Farbbalkengenerator	: Vorhanden
Synchronisierung	: Intern; integrierter Taktgeber (NTSC; RS-170A/PAL; PAL-B) Extern; FBAS oder Black Burst Color Frame Ausgang vorhanden
Austastregelung	: Vorhanden
Automatik-Blende	: Normal und Einstellung auf +50 % (halber Blendenwert) möglich
Eingangssignale	: Sucher: FBAS, 1 Vs-s 75 Ω Genlock: FBAS (1 Vs-s, 75 Ω) oder Black Burst (BB, 0,45 Vs-s, 75 Ω) Mikrofon: -52 dBm, 600 Ω symmetrisch
Ausgangssignale	: FBAS (VBS): 1 Vs-s, 75 Ω (x2, von BNC- und 14-pol-Buchse) Testsignal (VS/VBS): R, G, B, R-G, B-G, ENC, AUX Audiosignal: -52 dBm, 600 Ω symmetrisch/-20 dBs, unsymmetrisch (umschaltbar) Audio-Monitorsignal: 8 Ω, -20 dB Videorekorder-Steuersignal: Kontakt oder +4 V Kontakt (umschaltbar)
Umgebungstemperatur-Bereich	: -20 bis 45°C
Leistungsaufnahme	: 12 V Gleichstrom, 1.5 A (NTSC)/1.55 A (PAL) (ohne Sucher und Obijektiv)
Gewicht	: 3,5 kg

Standard-Zubehör : Mikrofonhalter (SCUA 30312)
Stativadapter (KA-500)
PCB-Adapter
Testkarte (GP43078)
Staubschutzhülle
Schultergurt
Bruststütze (KA-111)
PCB-Zieher

Abmessungen



Technische Änderungen vorbehalten.

MANUEL D'INSTRUCTIONS: CAMERA VIDEO COULEUR KY-210

A cause de certaines modifications pouvant survenir, les données de ce manuel d'instructions sont modifiables sans préavis.

AVERTISSEMENT:
POUR EVITER LES RISQUES D'INCENDIE OU D'ELECTROCUTION, NE PAS EXPOSER L'APPAREIL A L'HUMIDITE OU A LA PLUIE.

Protection des tubes:
Les tubes pouvant être endommagés par des rayons lumineux puissants, ne pas diriger la caméra vers le soleil. De même, si le circuit de déflexion s'arrête accidentellenment, couper rapidement l'alimentation et recouvrir l'objectif pour protéger Les tubes de dommages.
Quand la caméra n'est pas utilisée, fixer l'obturateur et placer le filtre (⓮, page 66) sur la position "1".

SYSTEME D'ALIMENTATION

Cette caméra vidéo couleur ne doit être utilisée que sur courant continu de 12 V.

ATTENTION:

Pour éviter les chocs électriques et les risques d'incendie, NE PAS utiliser d'autres sources d'alimentation.

Nous vous remercions pour l'achat de la caméra vidéo couleur KY-210 JVC.
La KY-210 est une camera extrêmement compacte et robuste conçue pour de nombreuses applications, à l'intérieur et à l'extérieur. Utilisée avec un magnétoscope portable, elle s'adapte à pratiquement toutes les situations.
Pour obtenir le maximum de cette caméra, nous vous conseillons de lire ce manuel avec attention. Après la lecture, le conserver pour une référence ultérieure.

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CARACTERISTIQUES

- **Faible coût/hautes performances, d'vne conception proche des cameras "broad cast"**
  SPG conforme au normes PAL-B, circuits de suppression variable H/V, circuit de "Gen Lock".
- **Construction en aluminium, moulé compacte roboste et légere por one meilleor Fiabitité er maniabilité.**
  Ne pèse que 3,5 kg.
- **Grande qualité d'image avec le système optique à prisme f/1,4 et trois tubes analyseurs Saticon***
  Haute résolution de 650 lignes, rapport signal/bruit vidéo de 54 dB et éclairage minimum de 40 lux.
- **Large gamme de fonctions automatisées pour un fonctionnement et une calibration plus aisés**
  Circuit de calage des convergences automatique, circuit de balance des blancs automatique, circuit de balance des noirs automatique, circuit anti comète (ABC), circuit de niveau de noir automatique (ABL), circuit de diaphragme automatique servo de type NAM, circuit de fermeture de diaphragme automatique.

Le circuit de "Gen Lock" nécessitent une source d'entrée stable; la KY-210 ne se verrouillera pas sur un magnétoscope sans un correcteur de base de temps.

*Marque déposée

PRECAUTIONS A OBSERVER

Précautions pour votre sécurité

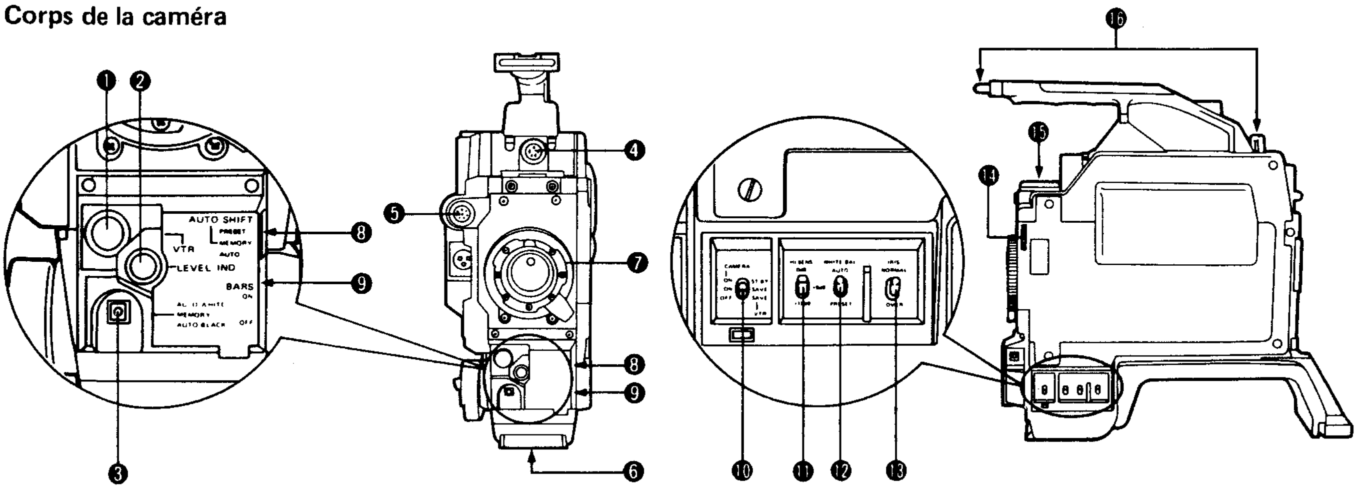
- N'utiliser que la batterie DC-C50 ou DC-C19 optionnelle ou l'adaptateur secteur AA-C50 optionnel.
- Ne pas laisser pénétrer de liquides inflammables, d'eau ni d'objets métalliques dans l'appareil car cela provoquerait des dommages ou de mauvais fonctionnements.
- Ne pas modifier l'appareil ni le faire fonctionner sans couvercle pour éviter le danger.
- En cas de fonctionnement anormal (bruit, odeur anormaux ou fumée etc.), couper immédiatement l'alimentation et faire réviser l'appareil par le centre de service agréé JVC le plus proche de votre domicile.

Précautions à observer lors de la manipulation

- **Tension d'alimentation**
  S'assurer que l'alimentation est comprise entre 10,5 V et 15 V CC. Si la tension est trop basse, des couleurs anormales et un excès de bruit risquent de se produire. Ne pas dépasser 15 V CC, dans n'importe quelle occasion sinon l'appareil sera endommagé.
- **Préchauffage**
  Cette caméra est suffisamment stabilisée environ 40 secondes après la mise en circuit. Cependant une meilleure stabilisation peut être obtenue après 10 minutes ou plus.
- **Protection du tube analyseur**
  Ne pas diriger l'objectif vers le soleil ou une source lumineuse puissante, une image fluorescente, un réflecteur etc. même si l'alimentation est coupée pour éviter l'endommagement des tubes analyseurs. S'assurer de laisser l'objectif recouvert en dehors des prises de vues ou des préparatifs de prises de vue.
- **Raccordement avec un magnétoscope portable**
  Des magnétoscopes différents exigent des modes de déclenchement marche/arrêt et des câbles de raccordement différents. Avant de raccorder, lire avec attention "Raccordement à un magnétoscope", page 74.
- **Casque d'intercommunication**
  Quand l'écouteur d'un casque d'intercommunication est placé trop près de la caméra, le magnétisme qui en provient peut affecter la convergence ou la balance des couleurs. Attention à ne pas placer le casque sur la caméra.
- **Température ambiante**
  La température sous laquelle la caméra peut être utilisée dépend du type des tubes analyseurs utilisés. Se référer au paragraphe correspondant dans les "Caractéristiques techniques", page 88. Cependant, le fonctionnement sous une température proche de la limite supérieure n'est pas recommandée pendant plus d'une heure pour éviter d'endommager les tubes.
- Quand il existe de fortes ondes électromagnétiques ou du magnétisme, par exemple par exemple pres d'um emeteur Radio TV etc., d'un transformateur, d'un moteur etc., l'image risque de contenir du bruit et les images d'être incorrectes.
- Quand un microphone sans fil ou un recepteur de microphone sans fil est utilisé près de la caméra, le recepteur risque de recueillir du bruit. Dans ce cas, sélectionner un autre canal.

COMMANDES, CONNECTEURS ET INDICATEURS

Corps de la caméra



① **Commutateur marche/arrêt du magnétoscope (VTR)**
Pour le déclenchement du magnétoscope. Ce commutateur fonctionne en parallèle avec le commutateur VTR de l'objectif standart.

② **Commutateur d'indicateur de niveau (LEVEL IND.)**
(Voir page 85)
Pour mettre en marche/à l'arrêt l'indicateur de niveau vidéo dans le viseur.

③ **Commutateur de la balance des blancs/noirs automatique**
Le réglage automatique des blancs est possible quand le commutateur WHITE BAL. ⑫ est sur "AUTO".

AUTO WHITE:	En faisant basculer le levier sur cette position tout en filmant un objet blanc, la balance des blancs est automatiquement réglée.
AUTO BLACK:	En faisant basculer le levier sur cette position, l'objectif est fermé et la balance des noirs est automatiquement réglée.
MEMORY:	Dans cette position, les réglages ci-dessus sont mémorisés.

④ Connecteur de viseur (VF)
La connexion se fait par coulissement du viseur optionnel le long du sabot de montage ⑮.

⑤ Connecteur d'objectif (LENS)
Raccorder le câble de l'objectif standard.

⑥ Montage de l'attache rapide du trepied

⑦ Bague de montage de l'objectif

⑧ Commutateur de réglage des convergences automatique (AUTO SHIFT)

PRESET:	Pour un réglage préréglé.
MEMORY:	Dans cette position, le réglage ci-dessous est mémorisé.
AUTO:	En faisant basculer le levier sur cette position tout en filmant la mire-test, le centrage des convergences est effectué automatiquement.

⑨ Commutateur des barres de couleur (BARS)
En le plaçant sur ON, le signal des barres de couleur est présent en sortie video.

⑩ Commutateur de fonctionnement (CAMERA ON/ON/OFF, VTR ST BY/SAVE/SAVE) (Voir page 77)
Trois positions sont prévues pour l'alimentation ON, OFF de la caméra et le mode "économie d'énergie" du magnétoscope.

⑪ Sélecteur de sensibilité (HI-SENS)
Pour l'utilisation sous un éclairage faible, la sensibilité de la caméra peut être amplifié de +9 dB ou de +18 dB. Le placer normalement sur "0 dB".

⑫ Commutateur de mode de réglage de la balance des blancs (WHITE BAL.)

AUTO:	Pour le réglage automatique en utilisant le commutateur ⑧.
PRESET:	Position préréglée pour une température de couleur de 3200°K.

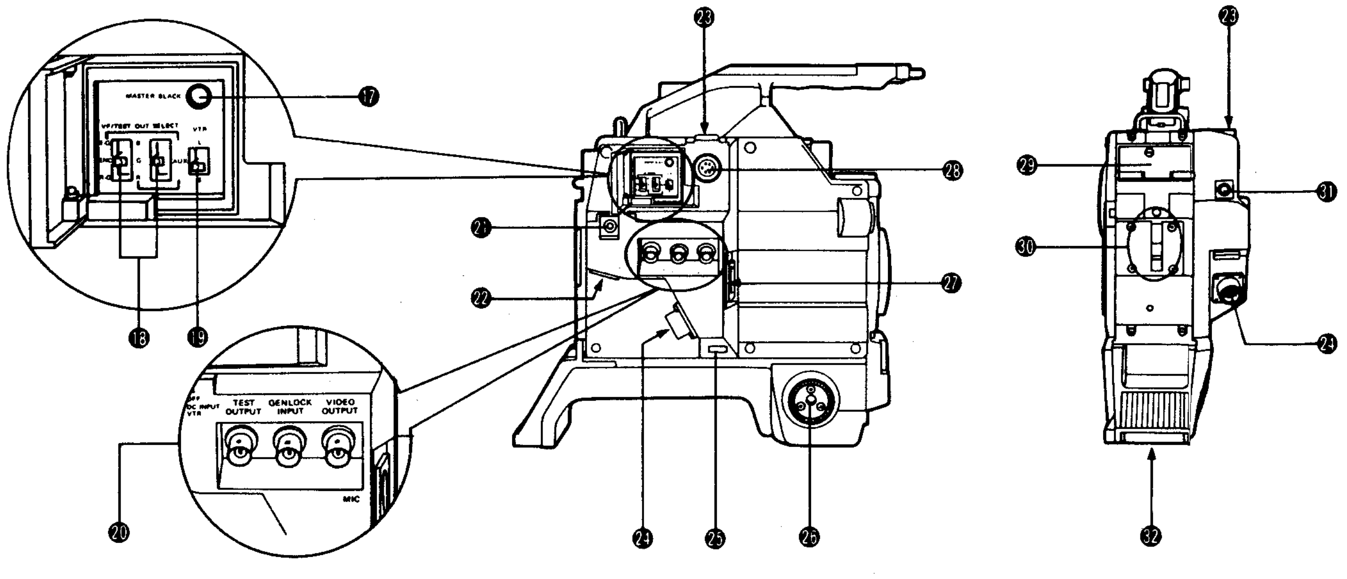
⑬ Commutateur de niveau du diaphragme (IRIS)
(Voir page 78)
Pour faire varier le niveau de reference le du diaphragme automatique.

⑭ Tourelle de filtre
La tourelle de filtre comporte quatre positions.

1. CLOSE: Mêmes conditions que lorsque l'objectif est recouvert.
2. 3200 K: Pour les prises de vues sous eclairage artificiel.
3. 5600 K: Pour les prises du vue à l'extérieur.
4. 5600 K +25 % ND: Le filtre gris (ND) de 25 % et le filtre de couleur 5600 K sont combinés pour les prises de vues à l'extérieur par beau temps.

⑮ Sabot de montage du viseur
Pour le viseur optionnel VF-215.

⑯ Crochets de la bandoulière
Pour la bandoulière fournie.



⑰ Commande de niveau de noir (MASTER BLACK)

⑱ Sélecteur de mode de déclenchement du magnétoscope (VTR) (Voir page 72)
Le placer selon le magnétoscope raccordé.

⑲ Sélecteurs de signal de sortie du viseur et de test (VF/TEST OUTPUT SELECT) (Voir page 69)
Pour la sélection des signaux present sur le connecteur TEST OUTPUT et sur le viseur.

⑳ Connecteurs de signal

VIDEO OUTPUT:	Le signal vidéo composite est mis en sortie.
GENLOCK INPUT:	Pour verrouiller la caméra, le signal vidéo composite ou blackburst de la source externe.
TEST OUTPUT:	Le signal de test sélectionné par les sélecteurs VF/TEST OUT SELECT ⑲ est mis en sortie.

㉑ Sélecteur d'alimentation (POWER)

La source d'alimentation peut être sélectionnée ou coupée par ce sélecteur.

RS : Choisir cette position quand la télécommande RS-500 est utilisée.

OFF : L'alimentation de la caméra est complètement coupée.

DC INPUT/VTR : L'alimentation est fournie par le connecteur DC INPUT ㉒ ou VTR ㉔.

REMARQUE: Se référer aux instructions du magnétoscope pour le courant de sortie limité de l'alimentation du magnétoscope.

㉒ Connecteur d'alimentation CC (DC INPUT)

Utiliser ce connecteur XLR Cannon à 4 broches pour fournir 12 V CC provenant de la batterie optionnelle DC-C50 ou de l'adaptateur CA AA-C50 optionnel.

Nº de broche	Fonction
1	Terre
2	
3	
4	+12 V

㉓ Sabot de montage de microphone

㉔ Connecteur de magnétoscope (VTR)

Utiliser ce connecteur à 14 broches pour raccorder un magnétoscope portable.

Nº de broche	Fonction	Nº de broche	Fonction
1	CC (TERRE)	8	TERRE
2	ENTREE CC 12 V	9	RETOUR ENTREE VIDEO
3	MIC (CHAUD)	10	ENTREE INDICATION BATTERIE
4	MIC (FROID)	11	SORTIE PULSATION IMAGE COULEUR
5	BLINDAGE MIC	12	ENTREE SIGNAL ENREGISTREMENT/ALARME
6	SORTIE/ENTREE VIDEO (CHAUD)	13	SORTIE SIGNAL MARCHE/ARRET MAGNETOSCOPE
7	BLINDAGE SORTIE/ENTREE VIDEO	14	SORTIE ECONOMIE ENREGIE/ENTREE CONTROLE AUDIO

㉕ Commutateur de niveau de sortie de microphone (MIC LEVEL)

Le niveau de sortie audio via le connecteur VTR ㉔ peut être commuté en deux étapes.

HIGH: Asy metrique −20 dB

LOW: −52 dB symerique.

㉖ Fixation du support de poitrine

㉗ Prise d'entrée de microphone (MIC INPUT)

Elle est prévue pour le raccordement de microphones symetrique au. L'entrée est parallèle connecteur MIC ㉘.

㉘ Connecteur de microphone exclusif (MIC INPUT)

(Voir page 73)

Pour le raccordement du microphone optionnel M-K50. L'alimentation du microphone à condensateur est fournie par cette prise à 6 broches.

㉙ Connecteur de boîtier de télécommande

Quand le boîtier de télécommande RS-500 est utilisé raccorder son adaptateur de caméra. (Pour plus de détails, voir les instructions fournies avec le RS-500.)

㉚ Compartiment de batterie

Pour la batterie optionnelle DC-C50 ou DC-C19.

㉛ Prise d'écouteur (EARPHONE)

Quand un magnétoscope portable est utilisé le signal audio de lecture peut être contrôlé par cette prise. (ϕ 3,6 mm)

㉜ Montage de làttache rapide du rvepied

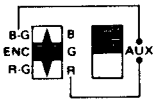
- **Sélecteurs de viseur et de sortie-test (VF/TEST OUT SELECT)**

Un des sept signaux ① à ⑦ peut être mis en sortie par les connecteurs de viseur et TEST OUTPUT.

① Sortie ENC (codeur de couleur)

② Sortie B-G (utilisée pour vérifier le calage)

③ Sortie R-G (utilisée pour vérifier le calage)



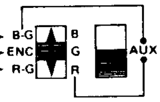
Placer sur la position supérieure

Les signaux de ① à ③ peuvent être mis en sortie avec le réglage ci-dessus.

④ Sortie de signal du canal B

⑤ Sortie de signal du canal G

⑥ Sortie de signal du canal R

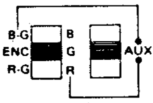


Placer sur la position inférieure

Les signaux de ④ à ⑥ peuvent être mis en sortie avec le réglage ci-dessus.

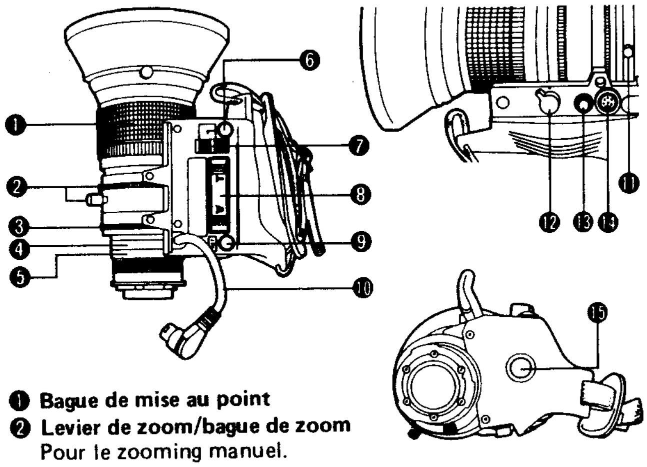
⑦ Sortie de signal AUX

⑪ est disponible avec le réglage indiqué à droite.



Placer sur la position centrale ("AUX").

Objectif zoom (HZ-510 optionnel)



❶ Bague de mise au point

❷ Levier de zoom/bague de zoom

Pour le zooming manuel.

❸ Bague de diaphragme

Quand le commutateur de mode de diaphragme ❼ est sur "M" le diaphragme peut être fermé et ouvert à la main avec cette bague.

❹ Bague de tirage optique

Pour le réglage du tirage optique.

❺ Bague macro

❻ Commutateur de diaphragme momentané

Même pendant le fonctionnement du diaphragme manuel avec le commutateur de mode de diaphragme sur "M" (manuel), le contrôle du diaphragme peut être automatique tant que ce commutateur est enfoncé.

❼ Commutateur de mode de diaphragme (IRIS)
A: Pour le fonctionnement automatique du diaphragme.
M: Pour le fonctionnement manuel du diaphragme.
R: Pour le fonctionnement par télécommande (avec le RS-500).

❽ Levier d'asservissement du zoom
La vitesse et la direction de l'asservissement du zooming sont contrôlées par ce levier basculant.

❾ Commutateur de retour de signal vidéo (RET)
Le signal vidéo de retour provenant du magnétoscope peut être contrôlé dans le viseur tant que ce commutateur est enfoncé.

❿ Câble d'objectif
Le raccorder au connecteur LENS sur la tête de caméra.

⓫ Bouton de fixation
Pour fixer la bague de firage optique.

⓬ Commutateur de mode de zooming (ZOOM)
S: Pour l'asservissement du zooming.
M Pour le zooming manuel.

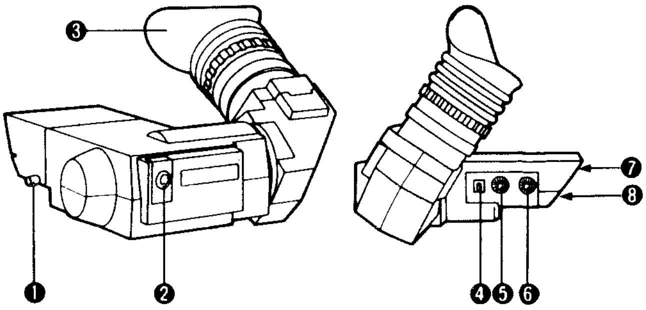
⓭ Connecteur de commande de servo mise au point

⓮ Connecteur de commande de servo zoom

⓯ Commutateur de déclenchement du magnétoscope (VTR)
Pour la mise en marche/à l'arrêt du fonctionnement du magnétoscope.

REMARQUE: Quand un objectif autre que le HZ-510 optionnel est utilisé, l'image risque parfois de contenir un ombrage dynamique dans le haut et le bas. Il est nécessaire d'effectuer un réglage interne et dans certains cas de régler à nouveau la mise au point arrière. Pour plus de détails, consulter votre revendeur.

Viseur (VF-215 optionnel)



❶ Vis de fixation
Pour fixer le viseur sur la tête de caméra.

❷ Lampe de signalisation
Quand la caméra est utilisée en connexion avec un magnétoscope portable, cette LED s'allume pour indiquer le mode d'enregistrement.

❸ Oeilleton
Un réglage de la dioptrie est possible.

❹ Commutateur de correcteur de piqué (PEAKING)
Pour mettre en valeur les contours de l'image pour une mise au point plus aisée.

❺ Commande de contraste (CONT)

❻ Commande de luminosité (BRIGHT)

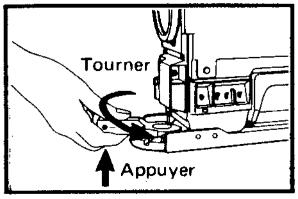
❼ Connecteur du viseur
Pour une connexion sans câble à la tête de la caméra.

❽ Collier de montage du viseur

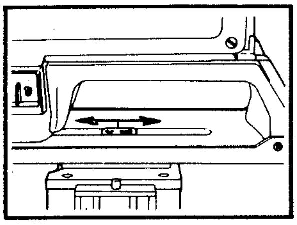
INSTALLATION

Installation sur trépied (avec pattache rapide KA-500)

1. La base de trépied est munie de trous de 1/4" et 3/8". Utiliser celui qui convient au trépied.
2. Placer la caméra sur pattache rapide (le levier à l'avant de la caméra). Fixer en tournant le levier vers l'orifice de fixation tout en enfonçant la touche de verrouillage.



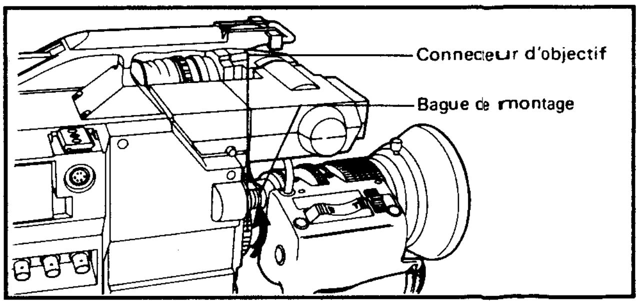
3. Le trou de montage du trépied peut être coulissée vers l'arrière et l'avant. Pour équilibrer la caméra sur le trépied, desserrer la vis du trépied, faire coulisser sur la meilleure position puis serrer la vis du trépied.



REMARQUE: Lors du retrait de la caméra du trépied, ne pas tourner le levier de la base du trépied trop violemment pour que la caméra ne tombe pas à cause du choc. Bien tourner le levier doucement tout en maintenant la caméra d'une main.

Installation de l'objectif (HZ-510 optionnel)

– Avant le montage/retrait de l'objectif, placer la tourelle du filtre sur la position "1" (CLOSE).

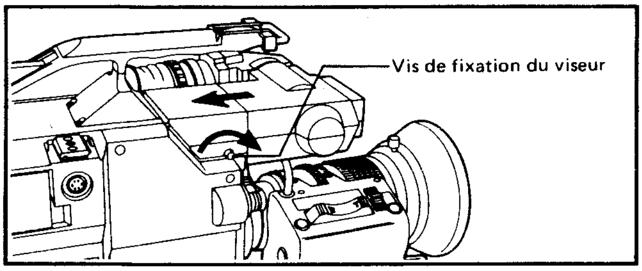


1. Retirer le couvercle arrieve de l'objectif en faisant attention à la saleté.
2. Aligner la broche de l'objectif avec l'encoche de la baillonette ette puis tourner la bague de montage dans le sens des aiguilles d'une montre jusqu'à ce que l'objectif et bjectif soient fixés fermement.
3. Raccorder le câble d'objectif à la tête de caméra.

REMARQUE: S'assurer que l'objectif est fermement fixé sinon le réglage de la mise au point arrière risque d'être incorrect.

Installation du viseur (VF-215 optionnel)

1. Insérer le viseur de par l'avant de la caméra en alignant l'encoche du viseur sur le sabot de montage du viseur sur la caméra.
2. Après que le viseur soit complètement inséré, fixer la vis de fixation du viseur avec un tournevis.



Sélection du mode de déclenchement du magnétoscope

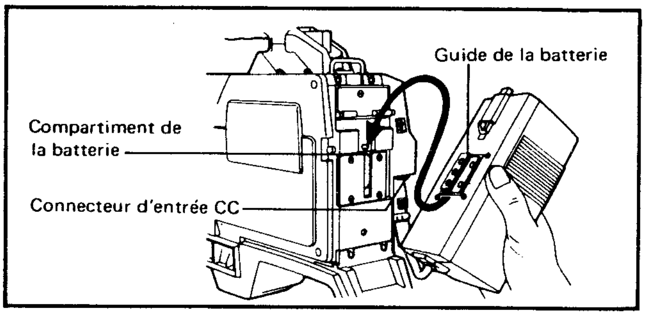
Le sélecteur VTR permet la sélection du signal de mise en marche/à l'arrêt du magnétoscope selon celui qui est raccordé. Placer le commutateur selon le tableau ci-dessous.

Position du sélecteur	Connecteur du magnétoscope	Mode de déclenchement
L	10 broches	Masse marche
B	14 broches	+4 V marche

REMARQUE: Le sélecteur VTR est initialement réglé sur "B" avant la sortie d'usine.

Installation de la batterie (DC-C50 optionnelle)

1. Insérer le guide de la batterie sur le compartiment de batterie ㉚ et appuyer pour qu'elle s'enclenche.
2. Insérer le connecteur de batterie sur le connecteur DC INPUT ㉒ de la caméra.



Fonctionnement de la batterie

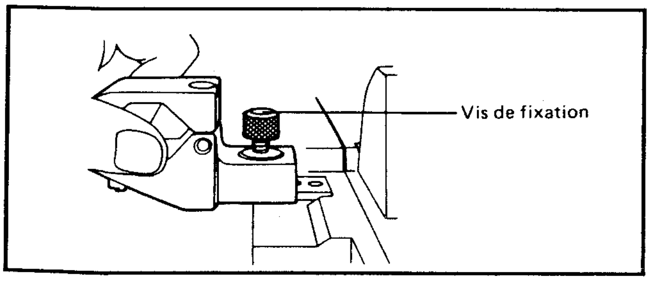
- Avec une batterie DC-C50 entièrement chargée, la caméra peut fonctionner pendant environ 60 minutes sous une température normale (environ 25°C).
- S'assurer de recharger la batterie avant l'enregistrement. Il est aussi recommandé de préparer quelques batteries chargées de rechange.
- Remplacer la batterie quand l'indicateur BATT (rouge) dans le viseur commence à clignoter.
- Utiliser l'adaptateur secteur AA-C50 optionnel pour charger la batterie. Pour le processus à suivre, se référer au manuel d'instructions du AA-C50.

Installation du microphone

Microphone ordinaire

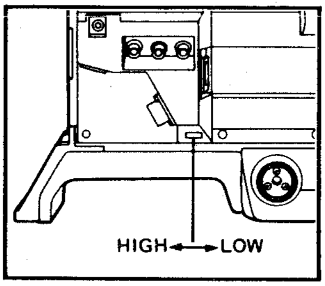
— Des microphones peuvent être installés sur le corps de caméra en utilisant le porte-microphone fourni.

1. Insérer le porte-microphone sur le sabot du dessus, gauche, de la caméra et fixer avec la vis.
2. Brancher le câble de sortie du microphone sur le connecteur MIC INPUT à 3 broches CANNON.



Niveau de sortie du microphone

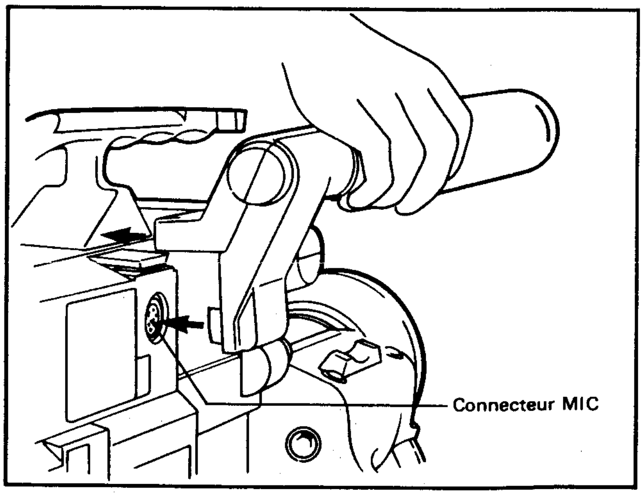
Le niveau de sortie du microphone peut être commuté sur "HIGH" (environ -20 dB) et "LOW" (–52 dB).



Microphone exclusif (M-K50 optionnel)

Le microphone M-K50 s'enclenche directement sur le corps de caméra. Le connecteur à 6 broches exclusif a la configuration indiquée dans le tableau.

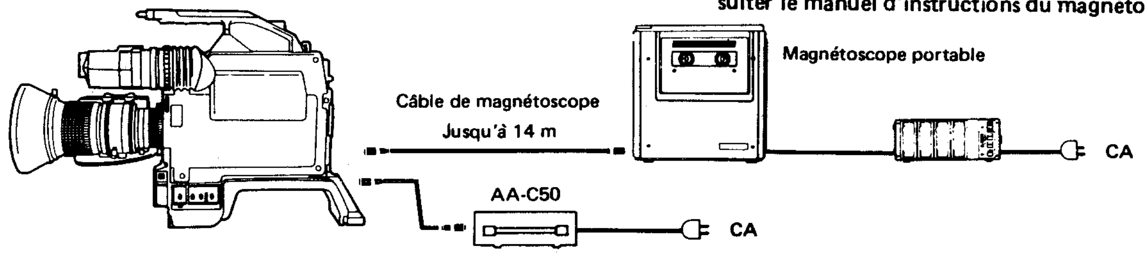
Nº de broche	Fonction
A	Neutre
B	+9 V SORTIE
C	TERRE
D	MIC (CHAUD)
E	MIC (FROID)
F	TERRE (BLINDAGE)



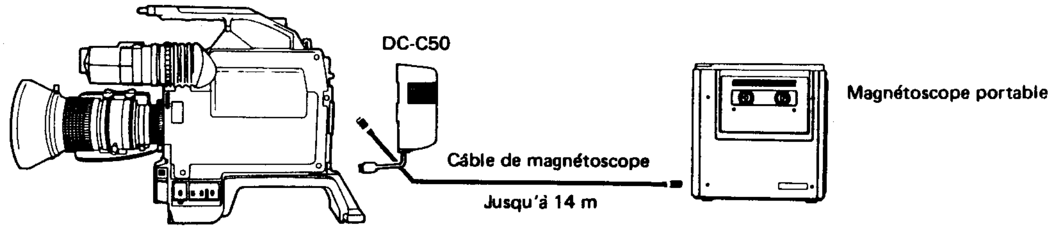
RACCORDEMENT AU MAGNETOSCOPE

Fonctionnement sur adaptateur secteur

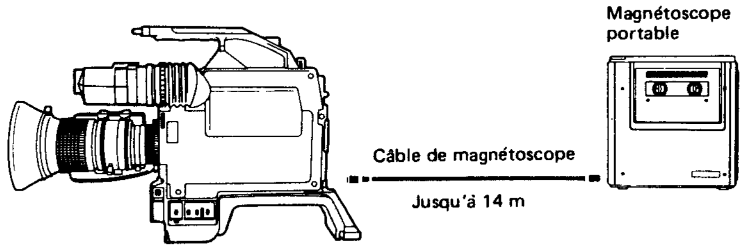
La KY-210 est conçue pour un meilleur fonctionnement avec un magnétoscope portable JVC. Certains magnétoscopes d'autres marques ne fonctionneront pas correctement avec les raccordements ci-dessous. Avant les raccordements, consulter le manuel d'instructions du magnétoscope etc.


Magnétoscope portable
Câble de magnétoscope
Jusqu'à 14 m
CA
AA-C50
CA

Fonctionnement sur batterie (DC-C50 optionnelle)


DC-C50
Magnétoscope portable
Câble de magnétoscope
Jusqu'à 14 m

Fonctionnement sur l'alimentation fournie par le magnétoscope portable

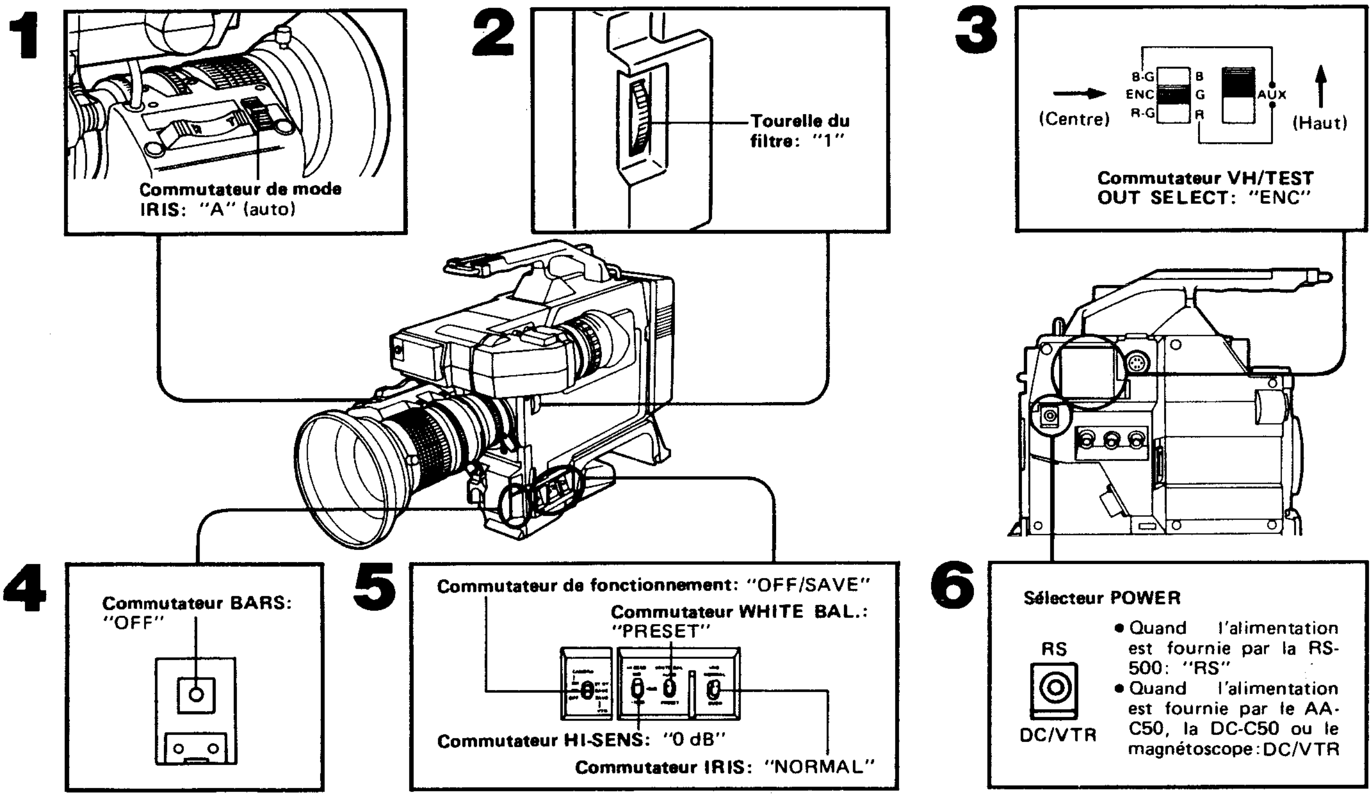

Magnétoscope portable
Câble de magnétoscope
Jusqu'à 14 m

REMARQUE: Si la caméra fonctionne par la batterie du magnétoscope, l'appareil risque de ne pas fonctionner ou la durée de fonctionnement de la batterie d'être courte à cause de la faible capacité de la batterie. L'alimentation fournie à la caméra ne doit pas dépasser la capacité de courant nominale du magnétoscope.

Magnétoscope raccordé	Câble de magnétoscope, 2 m (prolongement 10 m)	Mode de déclenchement	Niveau de microphone	Contrôle audio	Affichage d'alarme	
					Batterie caméra/ magnétoscope	Fin de bande ou ennui servo
CR-4400	VC-511B-2 (VC-582B)	L	H: -20 dB	X	O/X	X
HR-C3	VC-511B-2 (VC-582B)	L	H: -20 dB	O	O/O	X
BR-6200	VC-511B-2 (VC-582B)	L	H: -20 dB	X	O/X	X
CR-4700	VC-512B-2 (VC-589B)	B	L: -52 dBm or H: -20 dB	O	O/O	O

O : Possible
X : Impossible

PREPARATIFS


1
Commutateur de mode IRIS: "A" (auto)
2
Tourelle du filtre: "1"
3
B-G
ENC
R-G
B
G
R
AUX
(Centre)
(Haut)
Commutateur VH/TEST OUT SELECT: "ENC"
4
Commutateur BARS: "OFF"
5
Commutateur de fonctionnement: "OFF/SAVE"
Commutateur WHITE BAL.: "PRESET"
Commutateur HI-SENS: "0 dB"
Commutateur IRIS: "NORMAL"
6
Sélecteur POWER
RS
DC/VTR
● Quand l'alimentation est fournie par la RS-500: "RS"
● Quand l'alimentation est fournie par le AA-C50, la DC-C50 ou le magnétoscope: DC/VTR

Pour enregistrer une image claire avec des couleurs correctes, il est nécessaire de régler la balance des blancs, des noirs et le calage des convergences. Avant ces réglages, placer les commutateurs comme suit:

1. Placer le commutateur de fonctionnement sur "ON/SAVE".
   - Le courant du faisceau va passer dans les tubes analyseurs pour rendre les prises de vues possibles. Le diaphragme de l'objectif va aussi s'ouvrir.
   - Le commutateur de fonctionnement a les trois positions suivantes. Le fonctionnement de l'économie d'énergie est possible avec certains magnétoscopes avec la position SAVE.

Position du commutateur	Mode de la caméra	Mode du magnétoscope	
		Magnétoscope à 14 broches	Magnétoscope à 10 broches
ON/ST BY	Marche	Attente	Attente
ON/SAVE	Marche	Economie d'énergie	Attente
OFF/SAVE	Arrêt	Economie d'énergie	–

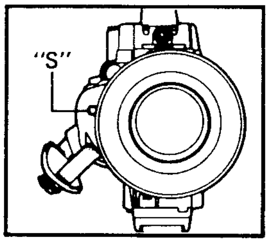
2. Pour obtenir une image avec des couleurs correctes, placer la tourelle du filtre selon l'éclairage de l'objet.

Position	Réglage	Conditions
1	CLOSE	Quand la caméra n'est pas utilisée
2	3200 K	Eclairage de studio, lever ou coucher du soleil à l'extérieur
3	5600 K	A l'extérieur, par temps nuageux ou pluvieux
4	5600 K + 25 % ND	Extérieur, par temps clair

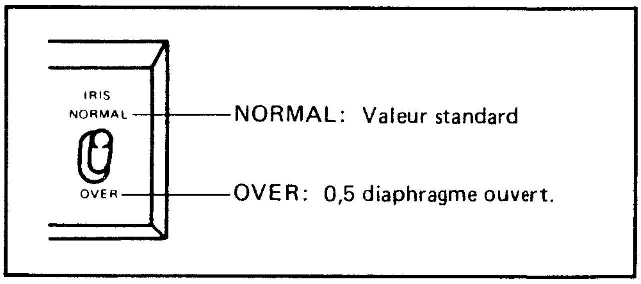
3. Diriger la caméra vers un objet normal, faire fonctionner l'objectif et contrôler l'image sur l'écran du viseur.
   - Régler les commandes BRIGHT et CONT du viseur.
   - Quand l'indicateur BATT (rouge) dans le viseur clignote, la batterie est presque déchargée; la remplacer par une qui est complètement chargée.

REGLAGE DU DIAPHRAGME DE L'OBJECTIF

- Avec le HZ-510, le réglage du diaphragme n'est pas nécessaire quand le commutateur de mode de diaphragme (A/M) sur l'objectif est sur "A".
  Le diaphragme se ferme automatiquement dans les conditions suivantes:
  1) Quand le commutateur BARS est sur "ON".
  2) Quand le commutateur de fonctionnement est sur "OFF/SAVE".
  3) Quand le commutateur des blancs/noirs automatique est basculé vers le bas sur "AUTO BLACK" pendant le réglage de la balance des noirs automatique.
- Avec certains objectifs, le fonctionnement du diaphragme automatique produit un oscillation dû à une surréaction. Dans ce cas, régler le potentiomètre "S" sur l'objectif selon le procédé ci-dessous.
  1. Régler le commutateur de mode de diaphragme (A/M) sur "A" pour le contrôle automatique.
  2. Régler l'éclairage pour que le diaphragme soit sur f/5,6.
  3. Obturer l'objectif pour éviter que de la lumière ne pénètre. (Le diaphragme sera complètement ouvert.)
  4. Découvrir l'objectif. Si le diaphragme est instable autour de f/5,6, régler le potentiomètre "S".
  5. Vérifier le fonctionnement du diaphragme avec le commutateur HI–SENS placé à "+9 dB" et "+18 dB". S'il y a encore un oscillation, répéter les étapes 2 à 4.



- Dans le fonctionnement du diaphragme manuel, la commutation de LEVEL IND sur "ON" provoque un forme zébrée sur le viseur; ceci indique 90 à 100 % du niveau vidéo par des bandes. Utiliser cet affichage pour votre référence.
- Dans le fonctionnement de diaphragme automatique, quand le sujet est relativement sombre comparé au niveau de l'image moyen, utiliser le commutateur IRIS pour faire varier la valeur de reference pour qu'elle convienne au niveau du sujet.



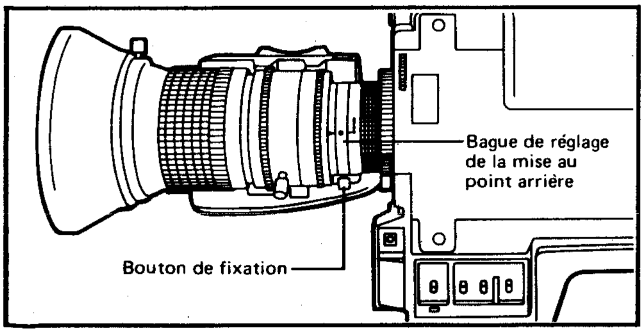
NORMAL: Valeur standard

OVER: 0,5 diaphragme ouvert.

REGLAGE DU TIRAGE OPTIQUE

Avec le HZ-510, la tirage optique peut être réglée sur le corps de l'objectif. Avant le réglage, vérifier que l'objectif est bien fixé sur la caméra.

1. Viser une mire de calage avec le diaphragme entièrement ouvert (fonctionnement du diaphragme manuel).
2. Si l'éclairage est trop fort, le diminuer ou changer d'endroit.
3. Tout en observant le signal G sur le viseur, effecteur un zooming avant et régler la mise au point.
4. Effectuer un zooming arrière jusqu'à la position grand angle puis tourner le bouton de fixation dans le sens contraire des aiguilles d'une montre pour le desserrer et tourner la bague de mise au point arrière pour que la mise au point soit la meilleure possible.

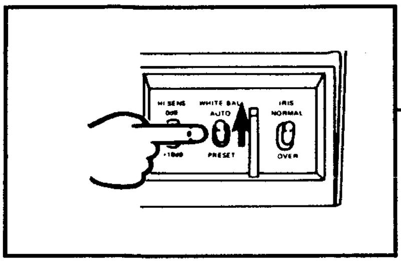


5. Répéter ces étapes plusieurs fois pour un réglage précis.
6. Après le réglage, serrer le bouton de fixation.

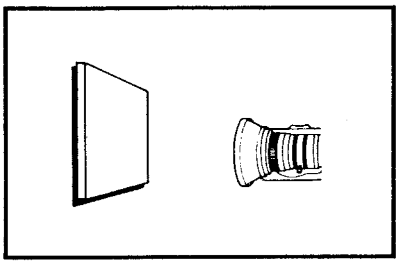
REMARQUE: Le réglage de la mise au point arrière est plus précis quand la distance entre le sujet (mire) et la caméra est de plus de 3 m.

REGLAGE DE LA BALANCE DES BLANCS

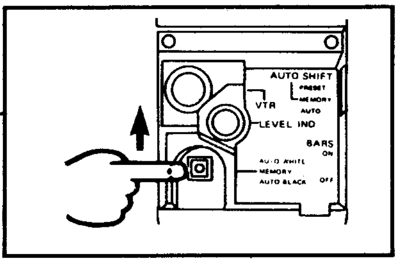
1 Placer le commutateur WHITE BAL dans la boîte des commutateurs sur "AUTO".

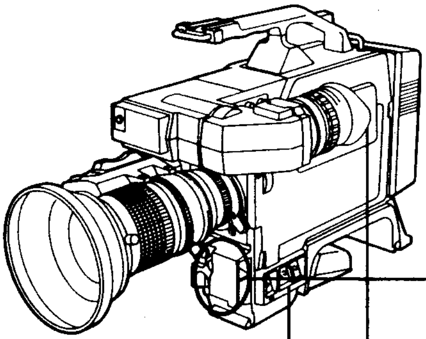

HI SENS
WHITE BAL
IRIS
AUTO
NORMAL
PRESET
OVER

2 Diriger la caméra vers un objet blanc (tissu, mur etc.) de manière à remplir le viseur.

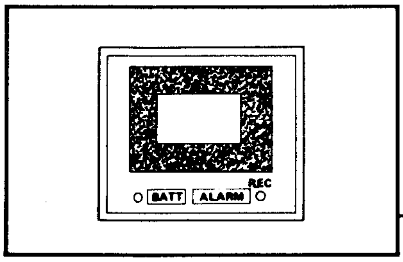


3 Faire basculer vers le haut et maintenir le commutateur AUTO WHITE/BLACK sur le côté "AUTO WHITE".

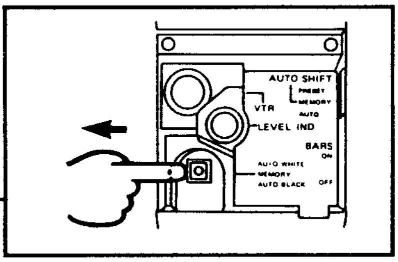

AUTO SHIFT
PRESET
MEMORY
VTR
AUTO
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF



4 Un carré blanc apparaît sur l'écran du viseur et il disparaît quand le réglage est terminé.

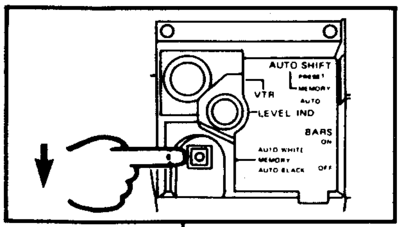

REC
BATT
ALARM

5 Relâcher alors le commutateur. L'état obtenu par le réglage de la balance des blancs est mémorisé.

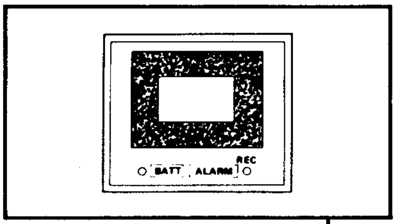

AUTO SHIFT
PRESET
MEMORY
VTR
AUTO
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF

REGLAGE DES LA BALANCE DES NOIRS

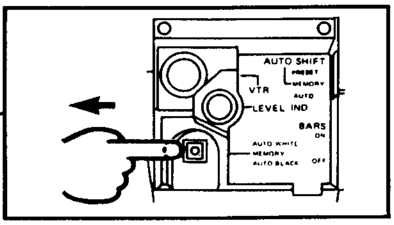
1 Faire basculer vers le bas et maintenir le commutateur AUTO WHITE/BLACK sur le côté "AUTO BLACK".

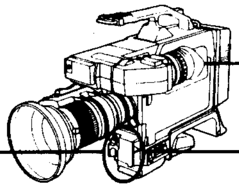

AUTO SHIFT
PRESET
MEMORY
VTR
AUTO
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF

2 Un carré blanc apparaît sur l'écran du viseur et disparaît quand le réglage est terminé.


REC
BATT
ALARM

3 Relâcher alors le commutateur. L'état obtenu est maintenu en mémoire.


AUTO SHIFT
PRESET
MEMORY
VTR
AUTO
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF



4 Puis répéter le réglage de la balance des blancs comme décrit à la page précédente. Après les deux réglages, les deux balances des blancs et des noirs sont terminés.

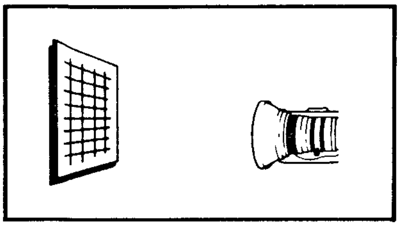
REMARQUES:

- La mémoire des états obtenus par les réglages automatiques est maintenue par une petite pile incorporée même après que l'alimentation a été coupée. Cette mémoire n'est pas effacée à moins que la pile ne soit déchargée ou qu'elle ne soit retirée pour un remplacement. (Pour le remplacement, consulter votre service JVC le plus proche).
- Même quand le commutateur de mode de diaphragme dans la section de l'objectif est sur "MANU", le diaphragme se ferme automatiquement pendant le réglage de la balance des noirs et il reste fermé quand le réglage est terminé.
- Si le carré blanc ne disparaît pas pendant le réglage de la balance des blancs bien que le commutateur de balance des blancs/noirs automatique soit maintenu en haut, la température de couleur est sans doute en dehors de la gamme réglable ou l'éclairage n'est pas suffisant. Dans ce cas, changer le filtre de couleur ou augmenter l'éclairage.
- Lors de prises de vues sous des éclairages différents, régler à nouveau le filtre de couleur et la balance des blancs/noirs automatique à chaque fois.

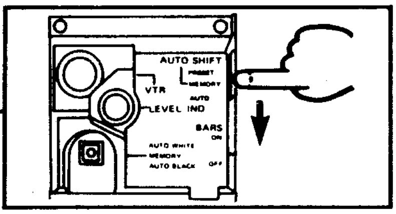
REGLAGE DU CENTRAGE DES CONVERGENCES

Le circuit de centrage des convergences de la KY-210 est muni d'un circuit de calage automatique. Le réglage de centrage qui utilise la fonction automatique est effectué selon le processus ci-dessus. Avant le réglage, le réglage de la balance des blancs et des noirs doit avoir été efectué.

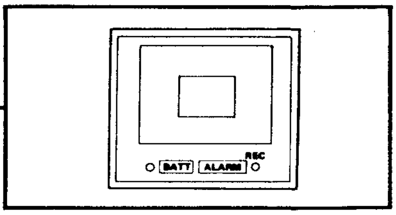
1 Viser un objet noir et blanc ayant des contours nets (une mire, un grille, etc.) pour que l'écran soit rempli.

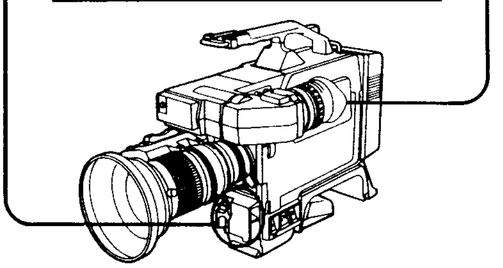


2 Faire basculer vers le bas et maintenir le commutateur AUTO SHIFT sur le côté "AUTO".


AUTO SHIFT
PRESET
MEMORY
AUTO
VTR
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF

3 Un signe comme indiqué ci-dessous est affiché sur l'écran du viseur et disparaît quand le réglage est terminé.


REC
BATT
ALARM



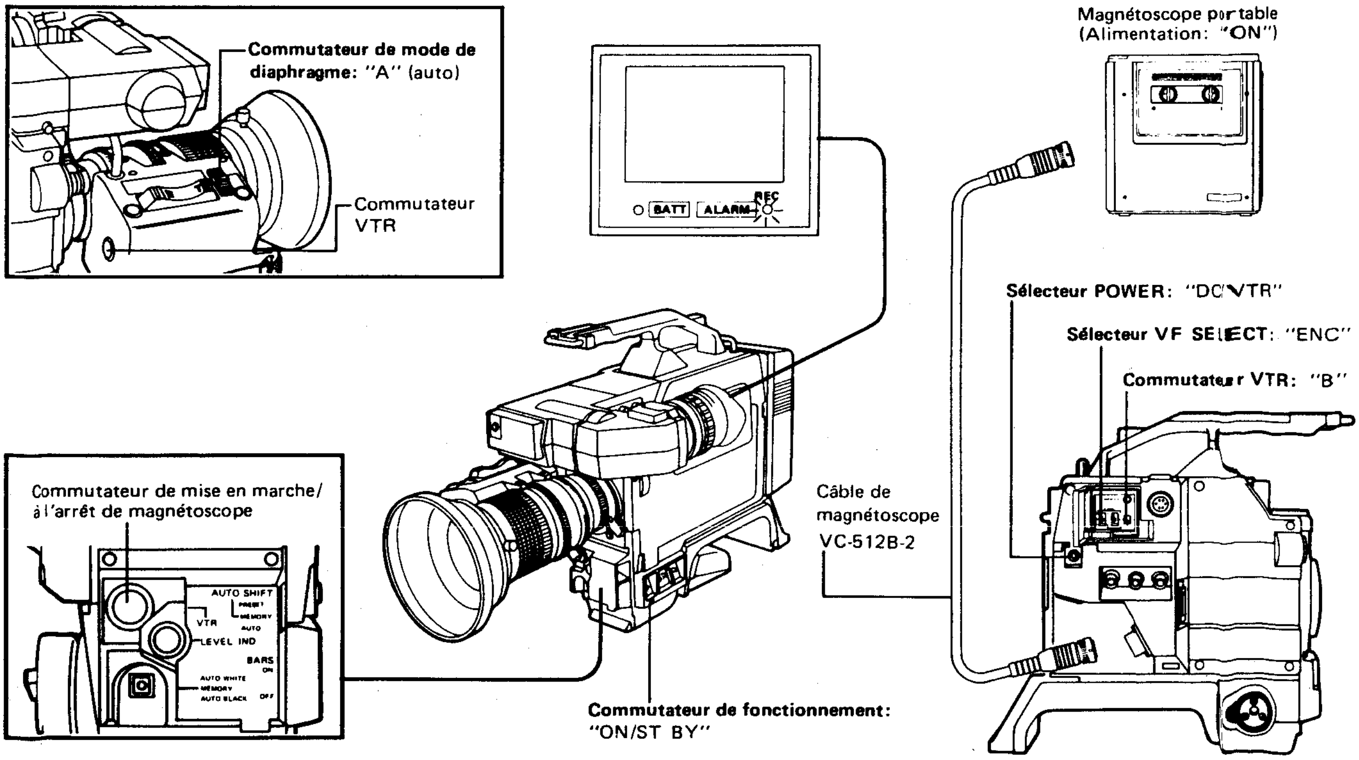
4 Relâcher alors le commutateur. L'état obtenu par ce réglage est automatiquement mémorisé.

- **Objet à utiliser pour le réglage**
  Pour un réglage correct, il est recommandé d'utiliser la mire fournie.

REMARQUES:

- Pour ce réglage, régler la distance entre l'objet et la caméra de manière à ce que la position du zoom soit aux environs du centre (et non en téléobjectif ou grand angle.)
- Si le signe ne disparaît pas bien que le commutateur AUTO SHIFT soit maintenu sur la position du bas, recommencer le réglage en vérifiant les points suivants:
  1) Le diaphragme de l'objectif est-il réglé correctement.
  2) La mise au point est-elle correcte.
  3) L'objet a peu de coins ou est coloré.

ENREGISTREMENT – Utilisation d'un magnétoscope portable (CR-4700 JVC) –


Commutateur de mode de diaphragme: "A" (auto)
Commutateur VTR
BATT
ALARM
REC
Magnétoscope portable (Alimentation: "ON")
Sélecteur POWER: "DC/VTR"
Sélecteur VF SELECT: "ENC"
Commutateur VTR: "B"
Commutateur de mise en marche/à l'arrêt de magnétoscope
AUTO SHIFT
PRESET
MEMORY
AUTO
VTR
LEVEL IND
BARS
ON
AUTO WHITE
MEMORY
AUTO BLACK
OFF
Câble de magnétoscope VC-512B-2
Commutateur de fonctionnement: "ON/ST BY"

Avant l'enregistrement

1. Raccorder le magnétoscope portable selon les instructions de "Raccordement au magnétoscope".
2. Régler les commutateurs comme indiqué à la page précédente.
3. Régler les balances des blancs et des noirs.
4. Mettre le magnétoscope en mode d'enregistrement.
5. Quand la bande commence à défiler, enfoncer le commutateur VTR sur l'objectif.
   - Le magnétoscope entrera en mode de pause d'enregistrement.

   Les préparatifs sont alors terminés.

Enregistrement

1. Enfoncer le commutateur VTR de l'objectif pour commencer l'enregistrement.
   - L'indicateur REC (vert) dans le viseur s'allumera.
2. Pour contrôler le signal vidéo de retour ou le signal vidéo de lecture du magnétoscope, enfoncer le commutateur RET sur l'objectif.
   - Quand la caméra est raccordée à un magnétoscope ordinaire non portable, le fonctionnement de la marche/arrêt risque de devoir être actionné sur le magnétoscope.
3. Pour contrôler le signal du microphone, utiliser la prise EARPHONE sur le côté gauche de la tête de caméra.
4. La KY-210 peut fournir une pulsation d'image couleur au magnétoscope via le connecteur VTR à 14 broches uniquement quand la caméra est synchronisée internement. Quand le verrouillage externe est utilisé, la sortie de pulsation d'image couleur est automatiquement coupée.

En ce concerne le fonctionnement du magnétoscope, se référer à son manuel d'instructions.

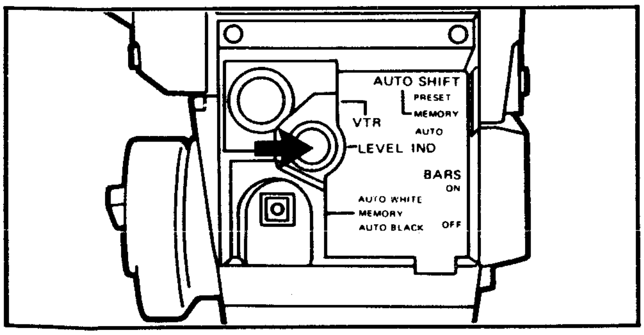
INDICATEURS DU VISEUR VF-215

Indication du niveau vidéo

Avec le viseur VF-215 optionnel, 90 à 100 % du niveau de signal vidéo peut être indiqué par des bandes. Cette forme zébrée est affichée uniquement quand le commutateur VF/TEST OUT SELECT est sur "ENC" et non sur les positions "REG", "R", "G" et "B"

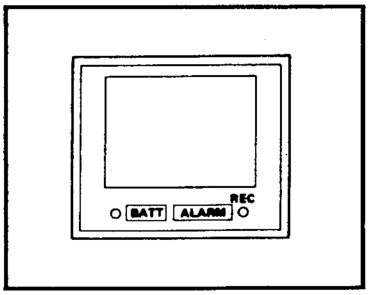
Cette indication de niveau vidéo est destinée à l'utilisation comme référence dans le fonctionnement de la commande de diaphragme manuel.

Le commutateur LEVEL IND est un commutateur alternant qui commute l'indication en marche et à l'arrêt à chaque pression.



Indication d'avertissement

Deux indicateurs LED sont prévus dans le viseur VF-215 pour donner un avertissement pendant les prises de vue.



Lampe BATT (rouge)

La LED rouge clignote quand la batterie de la caméra ou du magnétoscope (certains modèles) est presque déchargée.

Lampe REC (verte)

La LED verte s'allume pendant l'enregistrement, interverrouillée avec l'allumage de la lampe d'avertissement de l'avant.

Lampe ALARM (verte)

La LED verte clignote quand le magnétoscope a un ennui de servo ou quand la bande arrive en fin de course (avec certains modèles).

REMARQUE: Les fonctions ci-dessus dépendent du magnétoscope. Pour plus de détails, se référer au manuel d'instructions du magnétoscope utilisé.

Contrôle de l'image

Quand la caméra et le magnétoscope sont raccordés via un câble à multi-conducteurs, le signal vidéo provenant du magnétoscope peut être contrôlé dans le viseur comme indiqué ci-dessous. Le contrôle de l'image vidéo est pratique en particulier car il permet de vérifier l'image juste après l'enregistrement.

L'image contrôlée diffère selon la position du commutateur VF/TEST OUTPUT et le magnétoscope utilisé.

Modèle de magnétoscope		Image de caméra	Image vidéo
10 broches	CR-4400	Commutation automatique quand le commutateur est sur "ENC".	
	HR-C3		
	HR-2650		
	HR-2200		
	BR-6200		
14 broches	CR-4700	ENC	RET*

*RET: Le contrôle n'est possible que quand le commutateur RET sur l'objectif est enfoncé. Comme la fonction de contrôle en temps réel du magnétoscope portable CR-4700 est traité comme contrôle de l'image vidéo, elle n'est aussi possible que lorsque le commutateur RET est enfoncée.

- En ce qui concerne la lecture, se référer au manuel d'instructions du magnétoscope.

FONCTIONNEMENT DU GEN LOCK

La synchronisation est possible en appliquant un signal vidéo composite (VBS) ou un signal black burst (BB) à la borne GENLOCK INPUT.

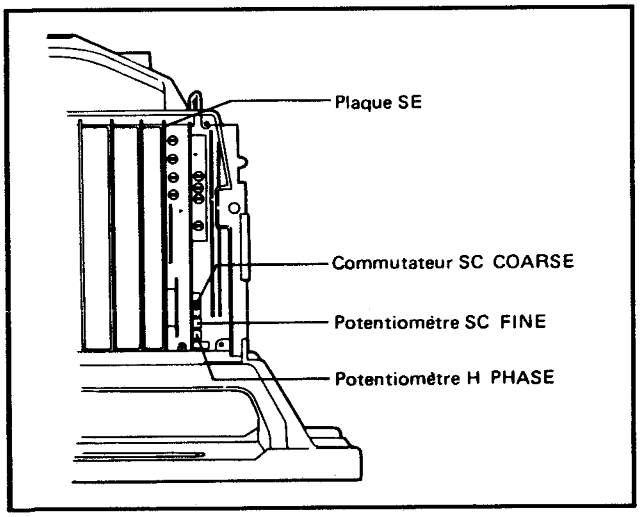
La phase de la sortie vidéo composite provenant de la caméra peut variée selon le signal d'entrée de référence.

Sync horizontale: +3 à -0,5 µs

Sync couleur: 360°

Processus de réglage de phase

1. Retirer le couvercle latéral droit de la caméra.



2. Utiliser les commandes suivantes sur la plaque SE.
   Phase de sync horizontale: potentiomètre H PHASE
   Phase de sync couleur: potentiomètre SC FINE (±60°)
   commutateur SC COARSE (0°/120°/240°)

REMARQUE: Le signal de lecture du magnétoscope ne peut pas être utilisé pour le verrouillage. Quand il est nécessaire d'utiliser le signal de lecture du magnétoscope comme signal de référence, le signal doit être corrigé avec un correcteur de base de temps (TBC), etc.

CARACTERISTIQUES TECHNIQUES

Caméra vidéo couleur KY-210

Système optique : f/1,4, système à prisme RGB tritube (avec filtre au quartz)

Montage d'objectif : Baïonnette

Filtre optique : Fermé, 3200 K, 5600 K, 5600 K +25 % ND

Tubes analyseurs : 2/3" Saticon* H4101
Mise au point électrostatique/déflection électromagnétique

Sensibilité : f/4 à 2000 lux

Rapport signal/bruit : 57 dB (NTSC -4,2 MHz largeur de gamme 4,2 MHz)/55 dB (largeur de gamme 5 MHz) nominal Gamma 1 (unité),
Correcteur de contour sur OFF

Sélection de sensibilité : 0 dB, +9 dB, +18 dB

Illumination minimum : f/1,6, 40 lux (+18 dB ON)

Convergence : Zone 1: 0,1 % maximum (cercle de 80 % de la hauteur de l'image)
Zone 2: 0,2 % maximum (cercle de la largeur de l'image)
Zone 3: 0,4 % maximum (région en dehors de la zone 2)

Résolution horizontale : 650 lignes (canal V au centre)

Correction de contour : Horizontale: à double bord
Verticale: 2H (avec filtre en peigne)

Codeur : NTSC (I,Q) PAL-B (U,V)

Masquage de matrice : Fourni

Générateur de barres couleur : Fourni

Système de synchronisation : Interne (SSG incorporé RS-170A; NTSC/PAL-B; PAL) ou genlocking externe par signal vidéo composite ou blackburst Sortie en impulsion de cadrage couleur

Réglage de la suppression : Fourni

Diaphragme automatique : Normal et +50 % (un demi diaphragme)

Signaux d'entrée : Signal vidéo de retour: vidéo composite, 1 Vc-c, 75 Ω
Signal genlock: vidéo composite (VBS, 1 Vc-c, 75 Ω) ou black burst (BB, 0,45 Vc-c, 75 Ω)
Microphone: -52 dBm, 600 Ω, symétrique

Signaux de sortie : Signaux vidéo composite (VBS): 1 Vc-c, 75 Ω (x 2, des connecteurs BNC et à 14 broches)
Signal de test (VS/VBS): R, G, B, R-G, B-G, ENC, AUX
Signal audio: -52 dBm, 600 Ω symétrique, −20 dBs, asymetrique (commutable)
Signal de contrôle audio: 8 Ω, -20 dB
Signal de commande de magnétoscope: contact ou +4 V (commutable)

Gamme des températures ambiantes : -20 à 45°C

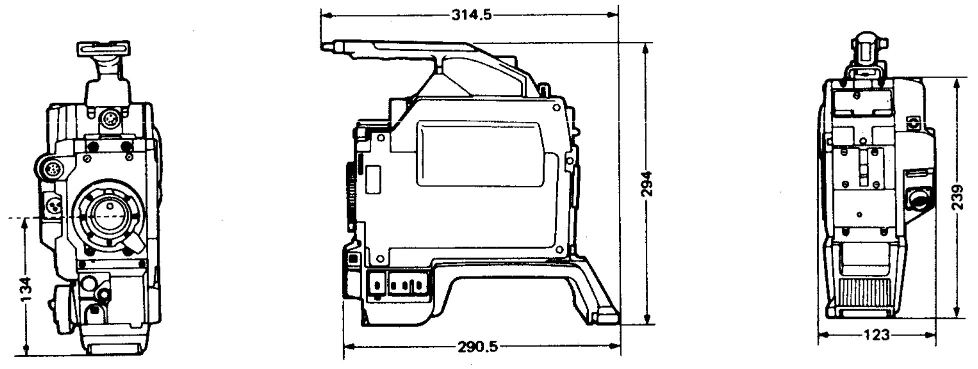
Consommation : 12 V CC, 1,5 A (NTSC)/1,55 A (PAL) (sans le viseur ni l'objectif)

Poids : 3,5 kg

Accessoires standard : Porte-microphone (SCUA 30312)
Bas de trépied (KA-500)
Plaquette d'extension
Mire de convergence (GP43078)
Couvercle anti-poussière
Bandoulière
Coussinet de poitrine (KA-111)
Extracteur de plaquette

* Marque déposée

Dimensions



Unité: mm

Présentation et caractéristiques modifiables sans préavis.

SECTION 1

CIRCUIT DESCRIPTION

1.1 HEAD AMPLIFIER

The video signal preamplifier is divided into two stages. The head amp incorporates a low-noise FET is mounted inside the deflection yoke.
This head amp is for impedance conversion and it has a gain of 1.
The head amplifier is alternative to KY-310 and KY-320 cameras.

1.2 PA BOARD

The PA board includes the following circuits.

1. Preamp circuit
   For amplification and frequency characteristic compensation
2. Shading correction circuit
   For static shading correction, dynamic shading correction signal generation, frame shading correction
3. Auto iris circuit
   For stabilization of black (black balance)

1.2.1 Preamp circuit

The first stage consists of a feedback loop of "head amp – Q201 to Q204 – head amp" and the gain of this amp system is about 1.
The video signal current from the pickup tube is input to the feedback circuit for the compensation of the frequency characteristic with load R. The LF trimmer (C201) compensates the frequency characteristic in the 1 to 2 MHz range (against a degraded picture with streaks, etc.) and R206 compensates frequencies around 4 to 6 MHz (against degraded resolution and increased noise).
Although HF adjustment requires a special pattern (in-mega cycle chart), HF re-adjustment is not necessary even after replacing the pickup tube.

The second-stage amp (Q206) adjusts the gain and outputs an approx. 0.3-Vp-p positive-polarity signal via output buffer Q207. The voltage of the T.BL period is sampled by Q205 and comparator IC9 controls the base bias of Q206.
This circuit fixes the pedestal level of Q207's output video signal at 3 V DC.

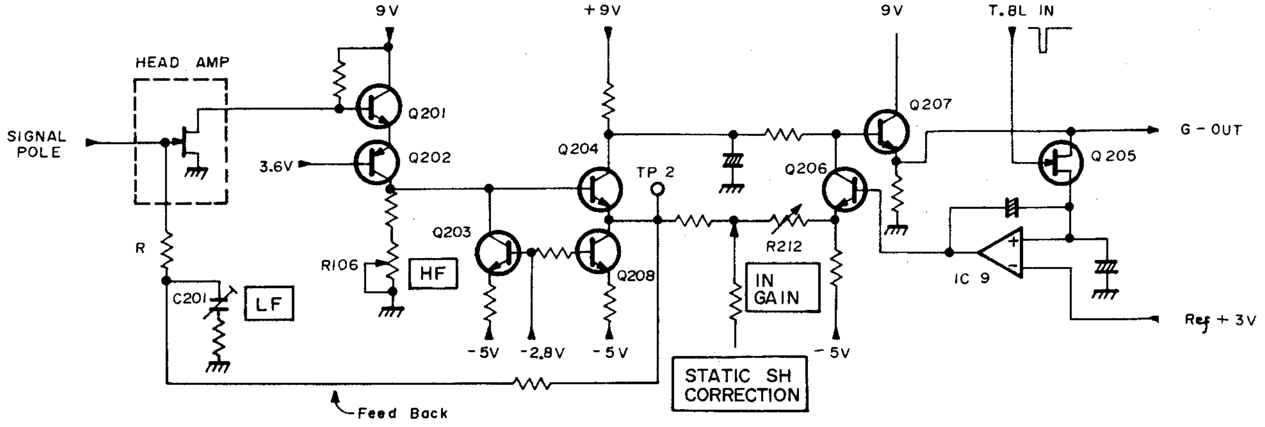


Fig. 1-2-1

1.2.2 Shading correction circuit

1. Static shading

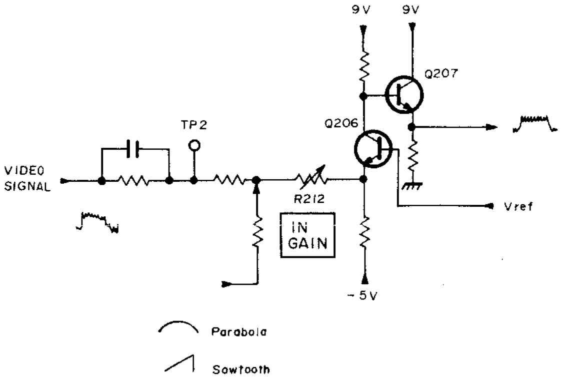
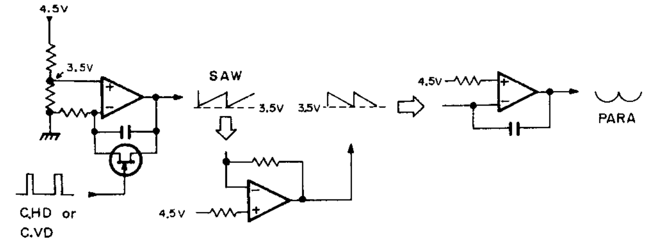

9V
9V
Q207
TP2
Q206
VIDEO SIGNAL
R212
IN GAIN
Vref
-5V
Parabola
Sawtooth

Fig. 1-2-2

With static shading correction, a correction signal is added to the video signal to eliminate color irregularities which occurs when the lens is capped, due to the influence of the bias light, etc.
Because the waveform of static shading is generally a combination of sawtooth and parabolic waves, signals from these two types of waveform generators are added to the video signal for correction. For instance, for the G ch, the correction signal is mixed at Q206 and signal at emitter-follower Q207 is uniform.
The correction waveform is formed by integrating the HD and VD pulses.


4.5V
3.5V
SAW
3.5V
3.5V
4.5V
PARA
C.HD or
C.VD
4.5V

Sawtooth wave generator

Inversion amp

Parabolic wave generator

Fig. 1-2-3

The integration circuit uses a Miller integrator with good linearity.
For the H period, the HD pulse is integrated to generate the sawtooth wave and the second integration generates the parabolic wave.

2. Frame shading correction
Frame shading is when the picture frame is seen as white. This is due to a special characteristic of pickup tubes and, when it is seen as video signal, the H and V signals are as shown on the right. (This phenomenon cannot be seen clearly when shooting an object under bright light.)

To compensate for the shading in the waveform shot when the lens is closed, an inverted waveform with the same amount of the shading is applied to cancel it.

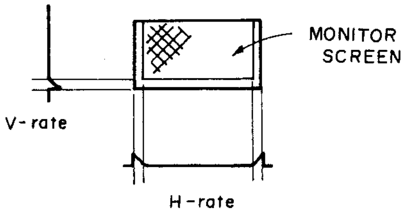
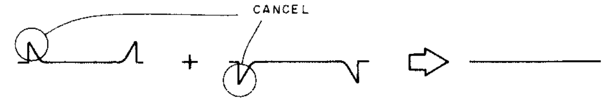

MONITOR SCREEN
V-rate
H-rate

Fig. 1-2-4



Frame shading signal   Correction signal

Fig. 1-2-5

The circuit for the correction of H scanning is shown below.

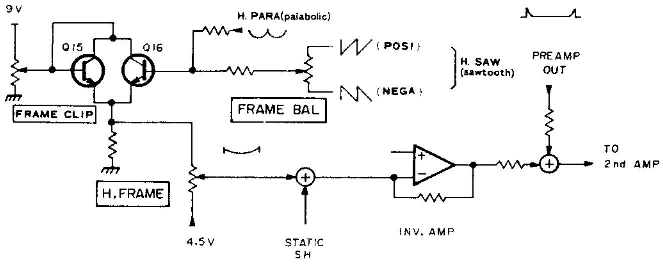

9V
H. PARA(palabolic)
Q15
Q16
(POSI)
(NEGA)
H. SAW (sawtooth)
PREAMP OUT
FRAME CLIP
FRAME BAL
H.FRAME
TO 2nd AMP
4.5V
STATIC SH
INV. AMP

Fig. 1-2-6

As the Q15 Q16 are a differentiation, the mixed H. PARA and H. SAW signals applied to the base of Q16 are clipped at the emitter.
Turning the FRAME BAL potentiometer enables either the positive and negative SAW signals to be mixed. This is necessary because frame shading is not always uniform on the left and right.

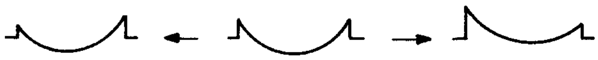


Fig. 1-2-7 Variation by FRAME BAL potentiometer

The FRME CLIP potentiometer determines the Q15 base bias: only the high-level signal from this bias value is output as the emitter output.

Fig. 1-2-8

The compensation signal passes through the inverting amplifier and is mixed with the preamp output for compensation.

The H. FRAME potentiometer adjusts the amount of compensation.

As the FRAME BAL and FRAME CLIP potentiometers function evenly for all channels, adjustment should be performed for the channel containing the greatest amount of frame shading.

3. Dynamic shading correction

   Dynamic shading is the color irregularity in the upper and lower parts of the screen which occurs in normal shooting; it is the difference between the brightness in the upper and lower parts of screen due to the difference of the lengths of the optical paths inside the optical system.

   As the shading amplitude increases according to the input illumination, video amplifier gain is controlled by the input signal and correction signal.

   Only the correction signal is generated on the PA board but correction itself is performed on the PR board. The correction signal is obtained from the mixed waveform of V. SAW and V. PARA waves which are used for static shading correction as described before.

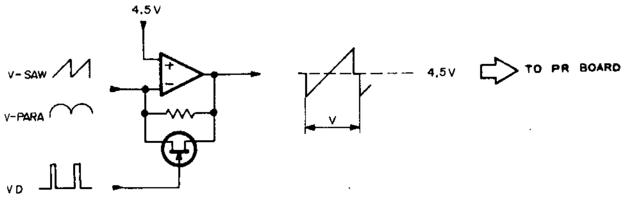


Fig. 1-2-9

The amount of dynamic shading is the smallest for B and larger for R and G. In consequence, correction is performed only for R and G to make their shading equal to that of B so that the color irregularities are eliminated.

1.2.3 Black correction (black balance) circuit

This circuit stabilizes the variation of black level in each of the R, G and B channels when the HI-SENS switch is set to "+9 dB" or "+18 dB".

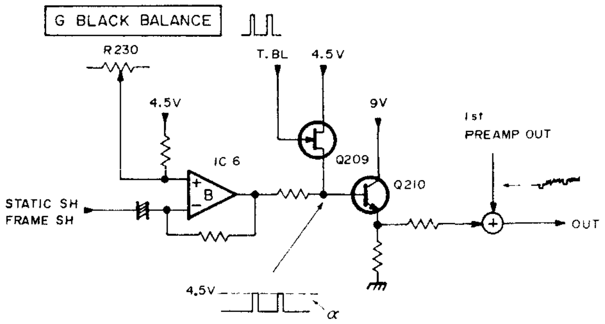


Fig. 1-2-10

Fig. 1-2-10 shows the black correciton (stabilization) pulse insertion circuit, which is used to reduce fluctuations in the signal due to the bias light.

The correction pulse is generated by IC6 and Q207 and is mixed with the output from the preamp circuit's first-stage amplifier to cancel fluctuations due to the bias light.

When the lens is capped, the preamp output (PA Board output), is as shown below.

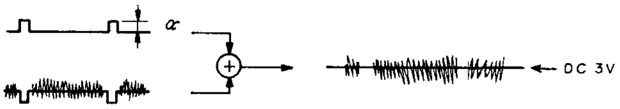


Fig. 1-2-11

The DC voltage (α) is varied by the BLACK BALANCE potentiometer. When the noise center of video signal is exactly on 3 V DC, the noise center does not move in terms of DC even when the HI-SENS switch is set to "+9 dB" or "+18 dB". When it is not exactly 3 V DC, the noise center changes by 3 times or 8 times respectively when the switch is set to the "+9 dB" and "+18 dB" positions.

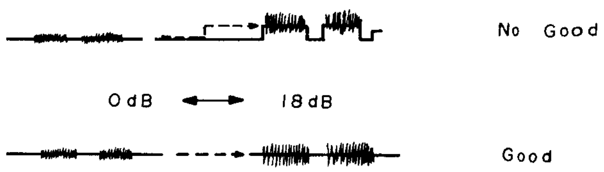


Fig. 1-2-12

1.2.4 Auto iris circuit

The lens iris is automatically controlled by the NAM (Non-Additive Mix: Highest level among the R, G and B signal outputs) signal.

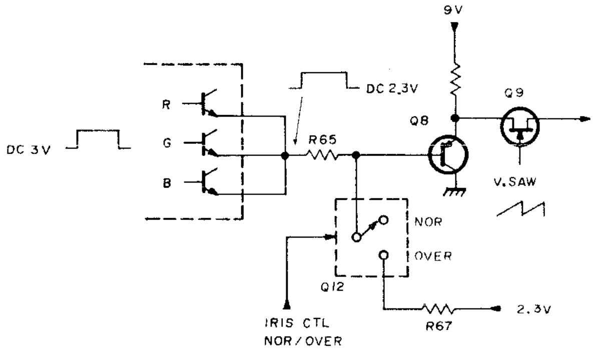

9V
R
G
B
DC 3V
DC 2.3V
R65
Q8
Q9
V.SAW
NOR
OVER
Q12
IRIS CTL
NOR/OVER
R67
2.3V

Fig. 1-2-13

From the R, G and B signals on the PR board, the one with the largest amplitude is input to the control circuit. Q12 is used to increase the set iris value by +50% (half an f-stop) more than standard and, when it is set for "OVER", setup DC is mixed via R67 so that the NAM signal level is decreased to 75%.

Q9 provides the difference in the level detection sensitivities for the upper and lower parts of the screen, so that the iris does not close too much even when the light incident to the upper half of screen is strong.

IC7-A is a buffer amp. The peak hold and integration circuit connected to its output.

The lens IRIS CTL (iris control) output is limited by Q10 so as not to drop below 2.2 V in normal operation. During auto black adjustment and color bars, Q3 of the MT-1 board is turned on to ground the IRIS CTL line so as to close the iris.

This forced iris closing operation operates even when the lens iris mode is set to "MANUAL", because Q2 and Q3 set the automatic iris mode by setting the AUTO CTL signal to H level (9 V).

When the camera power is switched off, the IRIS CTL line becomes 0 V. However, as the lens is provided with an unswitched power, 0 V of the control line is detected to force the iris to colose.

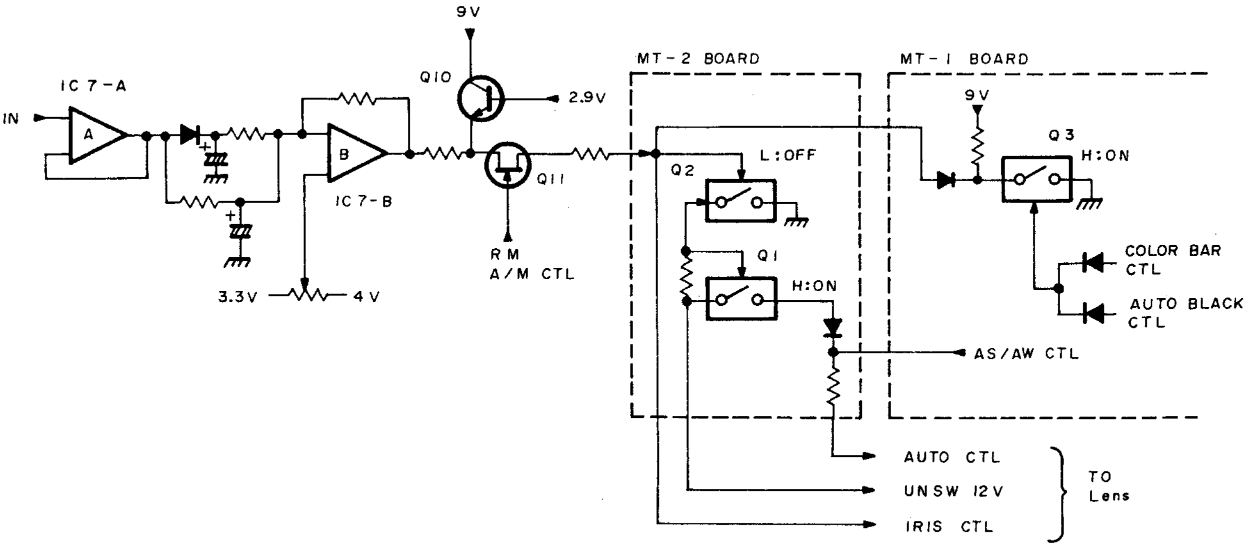

9V
IC 7-A
IN
A
B
IC 7-B
3.3V
4 V
Q10
2.9V
Q11
R M
A/M CTL
MT-2 BOARD
L:OFF
Q2
Q1
H:ON
MT-1 BOARD
9V
Q3
H:ON
COLOR BAR CTL
AUTO BLACK CTL
AS/AW CTL
AUTO CTL
UNSW 12V
IRIS CTL
TO Lens

Fig. 1-2-14

1.3 PR BOARD

The PR board contains signal waveform processing circuits from the preamp as the input signal (0.3 Vp-p). The PR board performs the following processes:

1. Electrical high-sensitivity
   Control of B/G/R channel gains at "+9 dB" and "+18 dB".
2. Dynamic shading correction
   Correction of only R and G channels.
3. Voltage controlled amplifier gain
   Control of R/B channel gains in auto white balance adjustment.
4. Signal amplification and black stabilizing
5. Black processing
   MASTER BLACK LEVEL, BLACK LEVEL, FLARE correction and ABL circuits.
6. Slope limiter
   KNEE slope.
7. Gamma correction
   Black compression circuit.
8. White clip/black slice
9. Matrix masking (COLOR MATRIX)

1.3.1 High sensitivity/Dynamic shading correction/Gain control

1. High sensitivity
   This circuit electrically boosts the sensitivity of the camera to 3 times (+9 dB) or 8 times (+18 dB) the standard sensitivity. The electrical gain boost (+9 dB, +18 dB) modifies the on/off condition of the FET in IC301 and thus the gain of IC302. The gain at output pin ⑫ of IC302 varies as follows.

$$R_{0dB} = \frac{RE}{R_A} = 1$$

$$R_{9dB} = \frac{RE(R_A + R_B)}{R_A \cdot R_B} \cong 3$$

$$R_{18dB} = \frac{RE(R_A + R_B + R_C)}{R_A \cdot R_B \cdot R_C} \cong 8$$

2. Dynamic shading correction
   Dynamic shading is seen as irregularities in the amount of light caused by the fact that the angle of incidence of of the beam onto the dichroic surface of pickup tube is not always stable with respect to the vertical axis of the picture of the beam-splitter optical system and is observed as variations in color reproduction. Dynamic shading is corrected by using the vertical (V) sawtooth and parabolic waves.
   The input at pin ③ of IC302 is a video signal with which the upper half of picture is brighter than the lower half even when shooting an object with uniform brightness.
   The input at pin ⑧ of IC302 is the V sync correction signal, which is supplied to QE for the correction and output with uniform level at pin ⑫.
   As the dynamic shading of B is the smallest of the three signals (R, G and B), ony the dynamic shadings of R and G are corrected so that they match the condition of the B channel.
3. Gain control
   When the auto white balance circuit is operated with a white subject, the R-ch and B-ch signals are adjusted to match the G-ch signal level (white balancing).
   The control DC is supplied from the AT board to the PR board, where the amplification gains of the R and B channels are varied to match the G amplitude.
   For the R and B channels, the gain control DC for the auto white balance adjustment are supplied to pins 10 of IC102 (B-ch) and IC302 (R-ch).
   The gain control DC supplied to pin 10 has a range voltage of 5 V DC ± 150 mV max. When this voltage is more than 5 V, the Qc gain (which controls the base bias of QF to vary the impedance) decreases. When the voltage is less than 5 V, the Qc gain increases.

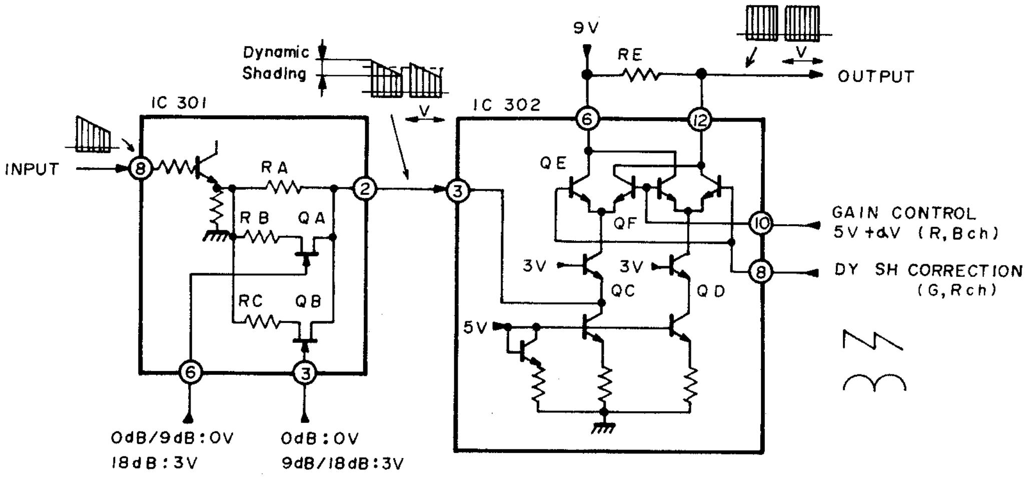


Fig. 1-3-1

1.3.2 Signal amplification/Black stabilization

This circuitry has the following purposes:

1. Amplification of the signal level so that it is enough for the gamma circuit in the next stage.
2. To stabilize black level variations in R/G/B channels (to prevent color irregularities).

The description will be given for the R channel.
After dynamic shading correction, the video signal is input to input pin ⑬ of IC303.
This is then amplified by amp QA and a differential amp composed of QB and QC so that level at TP3 is 1.2 Vp-p with the standard input level (which gives 0.2 Vp-p at TP2 on the PA board).
The level at TP3 can be adjusted with the IN GAIN (input gain) potentiometer on the PA board.

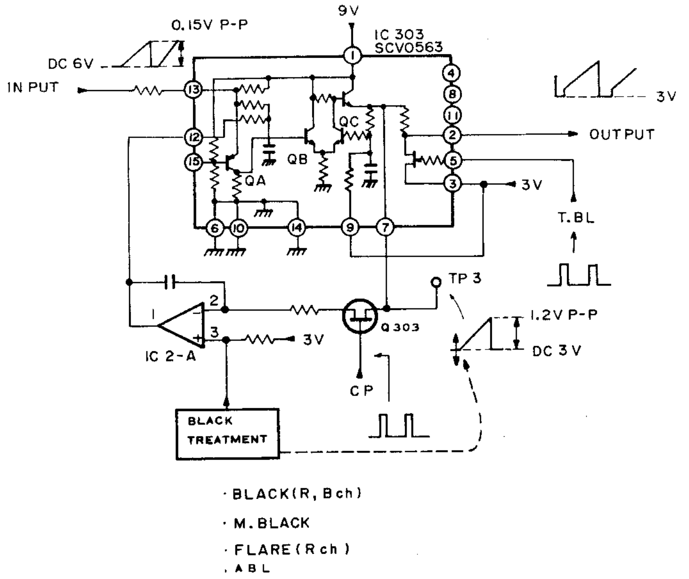


Fig. 1-3-2

The HD period of the video signal is sampled by Q303 using the clamp pulse (CP) and it is supplied to the negative (–) input of IC2-A, the positive (+) input of which is a voltage centered around 3 V DC with a variation of ±α V.
The output from this op-amp controls QA's emitter bias to clamp the video signal level at TP3 to 3 ±α V DC. This circuit can be considered as a kind of feedback clamp circuit.
As the result, the black level is determined at 3 ±α V DC.

1.3.3 Black processing

1. Black level control
The black level is adjusted independently for the R and B channels. The G-ch level is set using the MASTER BLACK potentiometer together with the R/B levels. During auto black balance adjustment, the control signal is supplied from the AT board.

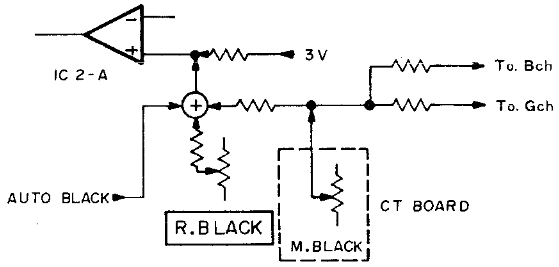


Fig. 1-3-3

2. Flare correction/ABL
Flare is a fluctuation of the black level in the video signal, caused by the characteristics of individual pickup tubes (due to irregular reflection of incident light). As flare is the biggest with the R signal, correction is performed for the R channel.
Although the flare correction circuit can correct the difference between the R/G/B channels, it does not eliminate fluctuations in the black components due to irregular reflections. The ABL (Automatic Black Level) circuit reduces flare by varying the black level automatically according to the amount of incident light.
As fluctuations in the black level are proportional to the APL, the flare correction circuit and ABL circuit obtain the Y (luminance) signal from the R/G/B signals using a resistance matrix so that increases Y reduces the black level.

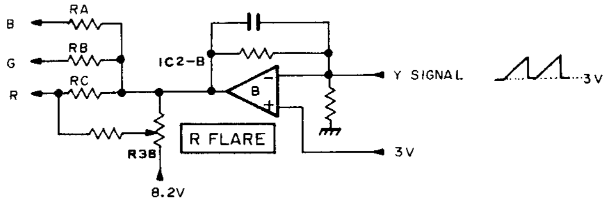


Fig. 1-3-4

The ABL circuit has no adjustment potentiometers; operations are determined by the values of RA, RB and RC.

1.3.4 Slope limiter

Although the video signal level is limited at 110% by white clipping, this is not enough as the slope from 100% to 110% would be left linear as shown in Fig. 1-3-5.

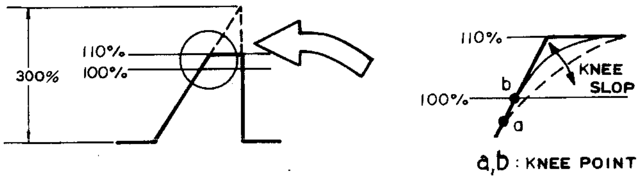

300%
110%
100%
110%
100%
b
a
KNEE SLOP
a,b : KNEE POINT

Fig. 1-3-5

To remain the picture information over 100% level, the soft clip is provided over the specified point. This point is called the knee point and the soft clip after the knee point the knee slope. Knee adjustment consists of the adjustments of the knee point and knee slop gradient.

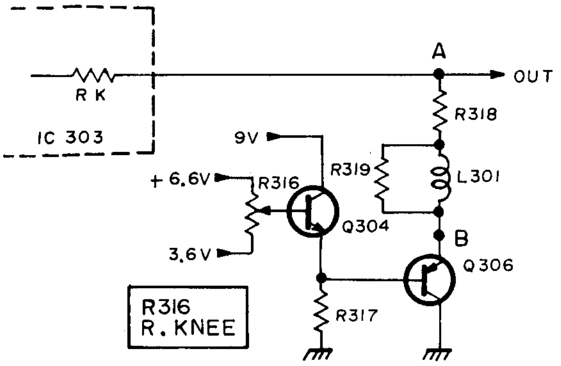

RK
IC 303
A
OUT
R318
9V
R319
L301
+6.6V
R316
Q304
B
3.6V
Q306
R317
R316
R. KNEE

Fig. 1-3-6

The knee adjustment circuit for the R channel is shown above.

R316 (R KNEE potentiometer) determines the Q304 base bias and consequently the voltage at the base of Q306.

This voltage level will be the start of the non-linear area, i.e. the knee point position.

When the potential (video signal amplitude + DC potential) at point A exceeds the potential at point B, emitter current starts to flow in Q306. The signal is compressed by the emitter load, that is the impedance between C and E and by the division ratio of RK.

1.3.5 Gamma correction

With Saticon tubes, the signal output is proportional to the light input and therefore, the gamma value is 1. On the monitor, the luminance is not proportional to the signal input and the gamma is between 2.2 to 2.4. With video camera standards, the ratio between the light input and signal output is determined so that gamma 0.45.

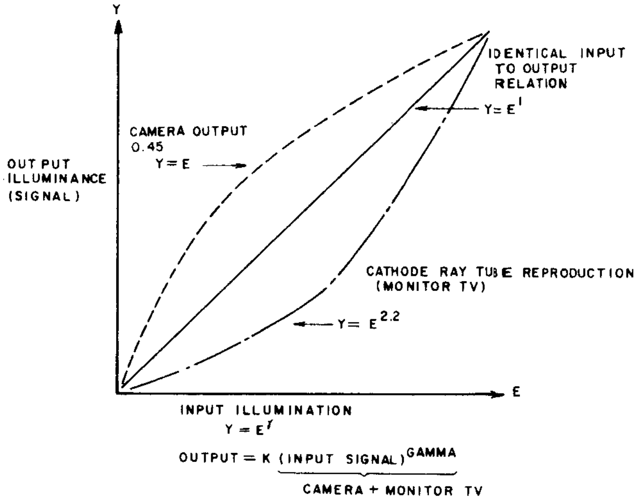


Fig. 1-3-7

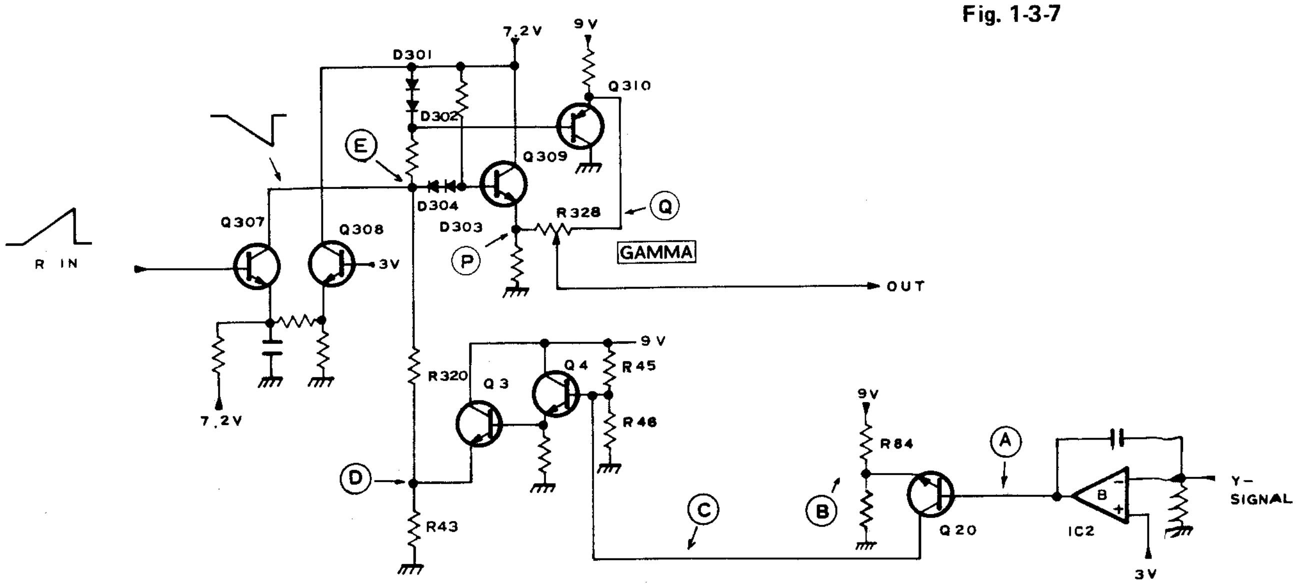

7.2V
9V
D301
Q310
D302
E
Q309
D304
R328
Q
D303
GAMMA
R IN
Q307
Q308
3V
P
OUT
7.2V
9V
R320
Q3
Q4
R45
R46
9V
R84
A
D
C
B
Q20
IC2
Y-SIGNAL
R43
3V

Fig. 1-3-8

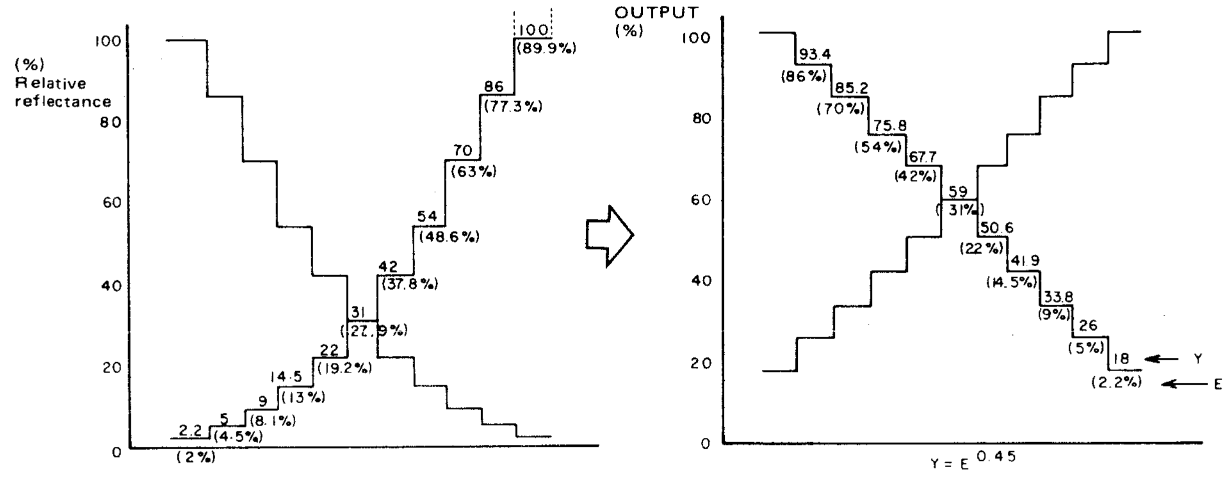


Fig. 1-3-9

The forward DC impedance of D301 and D302 connected to the collector of the Q307 amp varies non-linearly in proportion to the video signal level (which is the collector current of Q307).

Q310 is the output stage of the video signal with non-linear distortion, and the gamma characteristic obtained is approx. gamma = 0.45. (point Ⓠ)

Q309 is the output stage of the video signal which does not contain non-linearity. (point Ⓟ)

Q3 and Q4 are used for temperature compensation for the base potential variation by D301 and D302.

The GAMMA potentiometer is used to adjust the output characteristic between A and B .

The JVC Gray Scale Pattern GS-2 which makes the light incident to the camera is gamma = 2.2. When it is used, the camera gamma becomes 0.45 by adjusting the GAMMA potentiometer so that the waveform at the camera's video output is linear.

2.2	x	0.45 ≅ 1 (linear)
Test pattern		Camera

Black Compress

This circuit is added to part of the gamma circuit of the KY-210. This circuit is used to compress the black component to improve the apparent S/N on the monitor when a very dark object is shot.

However, the black compression circuit functions only when the video level is 50% (APL) or less.

Description is given for the R channel shown in Fig. 1-3-8.

The APL voltage inverted at 3 V is supplied to the base (point Ⓐ) of Q20.

When the HI-SENS switch is set to 0 dB, Q20 is off and the potential at point Ⓒ is as determined by R45 and R46 (approx. 8.2 V). The potential at point Ⓓ is then 7 V and bias is applied to the collector of Q307 (point Ⓕ via R320. Q307 and Q308 are constant power supplies and the current flowing from point Ⓓ to point Ⓔ is approx. 0.1 mA when the gain boost is 0 dB.

However, when the APL exceeds the 50% video level, the collector-emitter impedance of Q20 increases and Q20 turns off.

When the potential at point Ⓓ drops, the current flowing into point Ⓔ drops and the current flowing in D301 and D302 increases. This determines which position of the diode characteristic curve is used as the gamma curve.

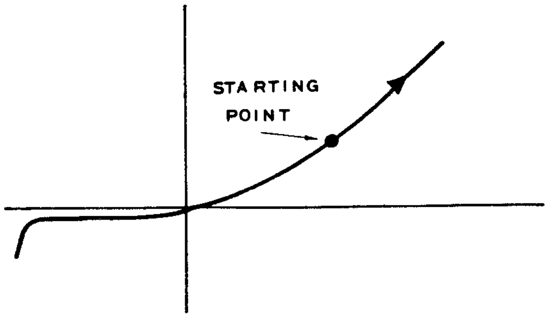


Fig. 1-3-10 Example when the video level is kept the same by switching the HI-SENS switch

1.3.6 White clip/Black slice

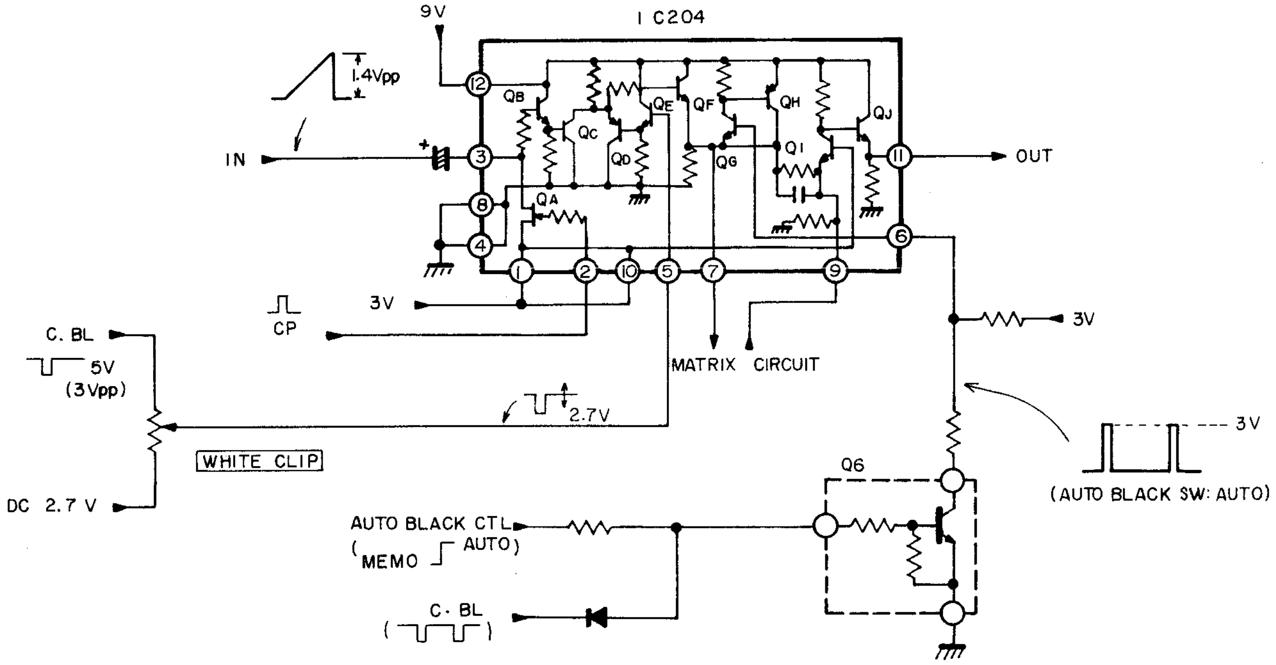

9V
I C204
1.4Vpp
IN
OUT
QB
QC
QD
QE
QF
QG
QH
QI
QJ
QA
3V
CP
C. BL
5V
(3Vpp)
DC 2.7 V
2.7V
WHITE CLIP
MATRIX CIRCUIT
3V
3V
(AUTO BLACK SW: AUTO)
Q6
AUTO BLACK CTL
(MEMO AUTO)
C· BL

Fig. 1-3-11

Vidicon-based pickup tubes as Saticons and Plumbicons have no saturation characteristic: when the incident light increases, the output signal also increases. To limit the signal level below a specified level, a white clip circuit in necessary.

The function of the black slice circuit is to eliminate noise in the blanking period as well as to vary the slice level in auto black adjustment so that the comparison of the black levels of R/G/B is easy.

Fig. 1-3-11 shows the white clip/black slice circuits of the G channel.

The input video signal, which is normally 1.4 Vp-p (0.2 Vp-p at the PA board TP2 and 1.2 Vp-p at the PR board TP2), is clamped at 3 V DC by QA.

The signal, after passing through emitter followers QB and QC, goes to QD and QE for blanking and mixing. White clipping is performed at this time, as shown below.

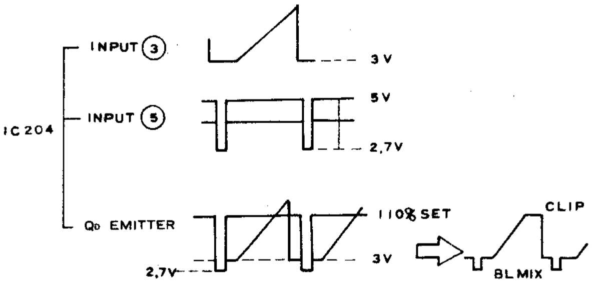

INPUT ③
3 V
INPUT ⑤
5 V
2,7 V
IC 204
QD EMITTER
110% SET
3 V
2,7 V
CLIP
BL MIX

Fig. 1-3-12

The base of QF is supplied with the video signal input and the base of QG is normally supplied with 3 V DC. In consequence, only signals of more than 3 V DC are output from the emitter of QG: in other words, the video signal is sliced at 3 V DC.

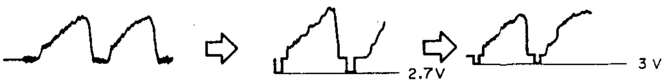


Fig. 1-3-13

During auto black adjustment the BL signal shown below is input to pin ⑥ of IC204 and the slice level is pulled down.

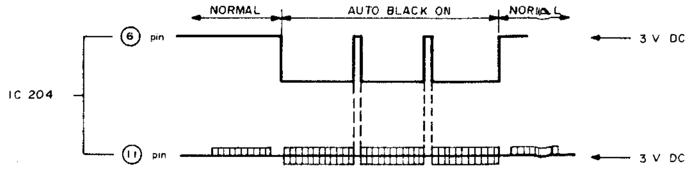
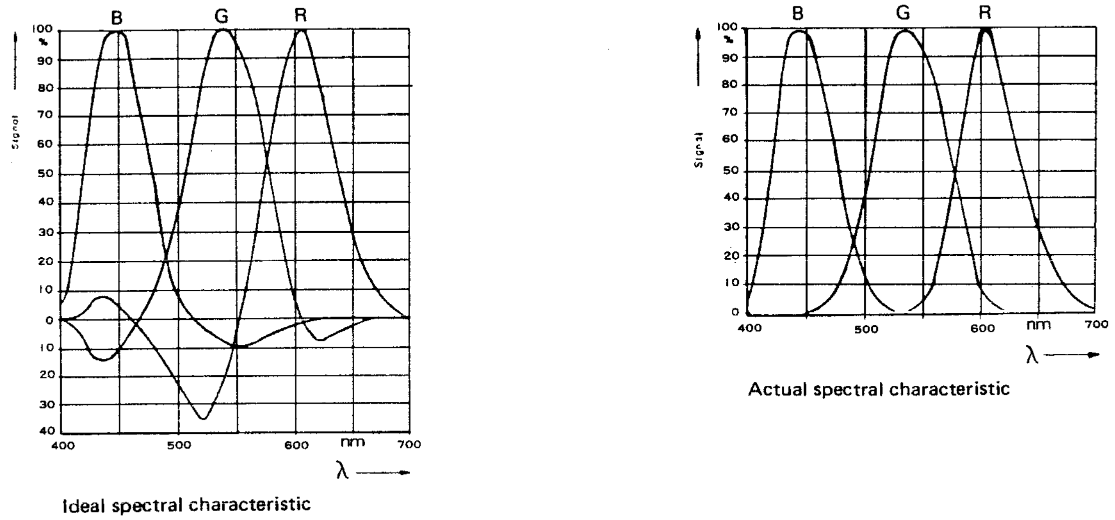

NORMAL
AUTO BLACK ON
NORMAL
IC 204
⑥ pin
⑪ pin
3 V DC
3 V DC

Fig. 1-3-14 Slicing the black level

1.3.7 Matrix masking



Ideal spectral characteristic

Actual spectral characteristic

Fig. 1-3-15 Ideal spectral characteristic
Actural spectral characteristic

Ideal color reproduction cannot be obtained by high performance of the beam-splitter optical system alone, because the principle of three-color spectral characteristic includes negative signal components (ones which absorb light).

Matrix masking is used to electrically compensate for this negative component.

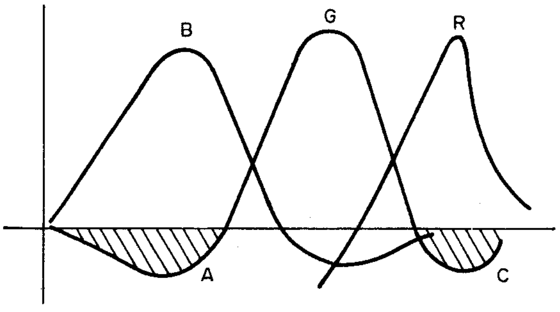


Fig. 1-3-16

In the equivalent electrical circuit, processing the negative component of the ideal characteristic requires the subtraction of the amplitude components, indicated by A and C (which refer to the R/B signals), from the G channel. The electrical processing is performed so that the G channel video signal = G − (A + C).

When the subject has no color component, the above is balanced so that both A and C have no output levels as shown below:

$A = K_A\ (G - B), \qquad C = K_C\ (G - R)$

The difference signals are obtained by differentially coupled transistors.

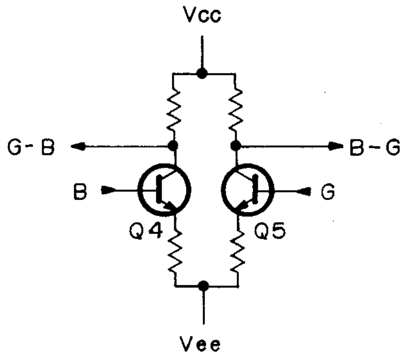


Fig. 1-3-17

1.4 CC BOARD

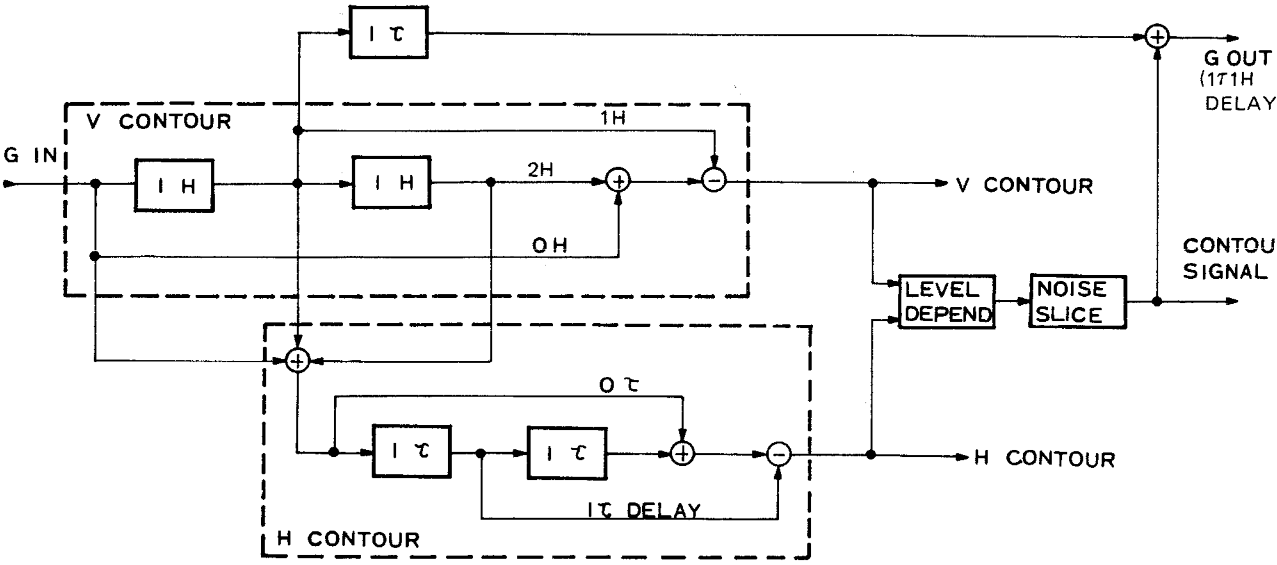

I τ
G OUT
(1τ1H
DELAY)
V CONTOUR
1H
G IN
I H
I H
2H
V CONTOUR
O H
CONTOUR
SIGNAL
LEVEL
DEPEND
NOISE
SLICE
O τ
I τ
I τ
H CONTOUR
Iτ DELAY
H CONTOUR

Fig. 1-4-1

This circuit board includes circuitry for electrical contour correction of the video signal.
Horizontal correction uses the 2H delay line and Vertical correction uses dual-edged correction. In both corrections, the G channel signal is used to generate the edge signal which is applied to the R/G/B video process amplifiers.
Fig. 1-4-1 is the block diagram of the contour correction circuits.

1.4.1 Vertical contour signal generator

As shown in the diagram on the right, the contour signal is generated by an electrical subtraction of signals delayed from the same signal. The delay time is long with 1H approx. 63 microseconds. To do this, the video signal is modulated at a high frequency (27 MHz) and is input to a glass delay line. Consequently, the V contour signal generator requires a different circuit from the H contour signal generator.

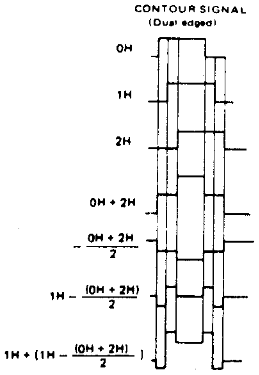


Fig. 1-4-2

1. After amplitude modulation with high carrier frequency (27 MHz), the video signal is passed the supersonic glass delay line.
2. AGC operation is necessary because the loss of the glass delay line is influenced by variations in temperature.
3. An amplifier and a demodulator for the video signal are necessary because the signal level drops when passing through the delay line.

With the reference pilot pulse for the AGC is added to the input G video signal during the V. BLK period, and then clamped with Q2.

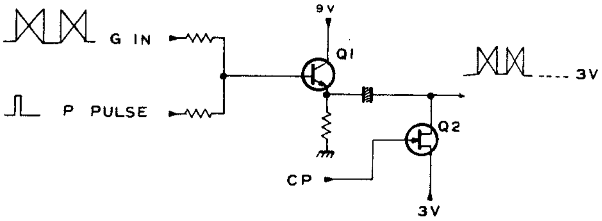

9V
G IN
Q1
3V
P PULSE
Q2
CP
3V

Fig. 1-4-3

A 27-MHz crystal oscillator generates the carrier signal.

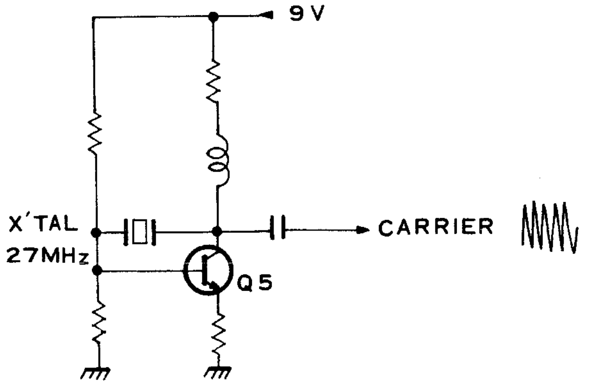

9 V
X'TAL
27MHz
CARRIER
Q5

Fig. 1-4-4 27 MHz OSC

By IC1 (NJM1496M), the clamped G signal, modulated with 27-MHz carrier, is output.

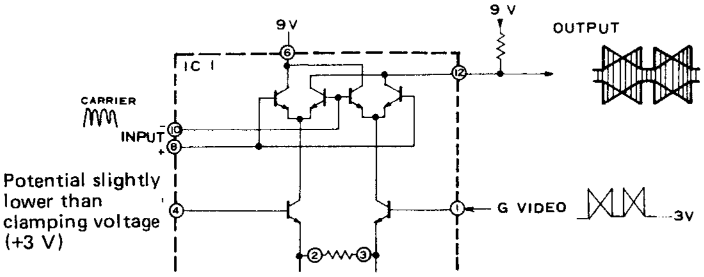

9V
9 V
OUTPUT
IC 1
⑥
⑫
CARRIER
INPUT
⑩
⑧
Potential slightly lower than clamping voltage (+3 V)
④
①
G VIDEO
3V
②
③

Fig. 1-4-5

The modulated signal is output via the glass delay line.

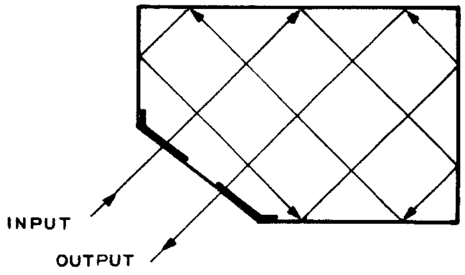

INPUT
OUTPUT

Fig. 1-4-6

The output of DL-1 is input to the differential amplifier. The emitter is coupled with an external FET so that the FET's impedance is varied by the AGC (DC) voltage so as to vary the gain.
The output then passes through a buffer goes to the next DL2, is demodulated and becomes the 1H delayed signal.

The 1H delayed output is input to the base of the differential couple of Q12 and Q13 to compensate the carrier component, and only its envelope is output at the common collector. The demodulated video signal is buffered and output as the 1H delay signal and at the same time it is supplied to the AGC comparator circuit.

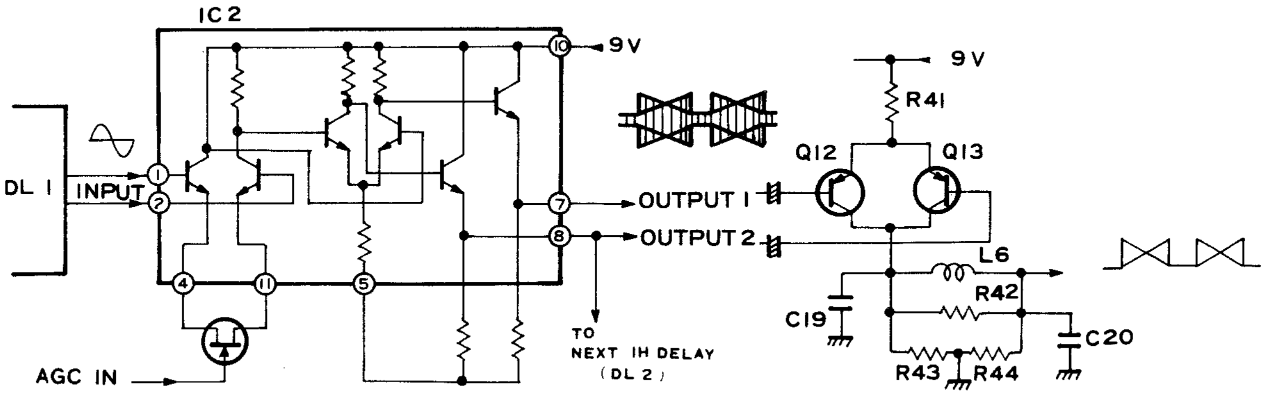

IC2
⑩
9V
9V
R41
DL I
INPUT
①
②
Q12
Q13
⑦
OUTPUT I
⑧
OUTPUT 2
L6
R42
C19
C20
④
⑪
⑤
AGC IN
TO NEXT IH DELAY (DL 2)
R43
R44

Fig. 1-4-7

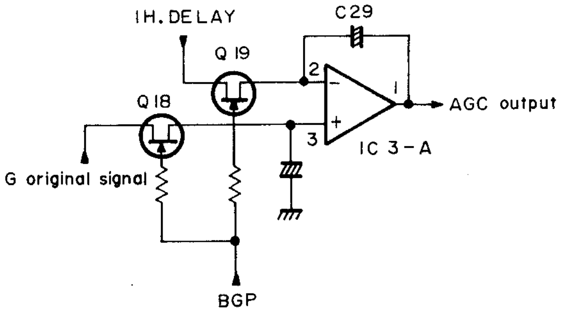

IH. DELAY
C29
Q 19
Q 18
2
1
3
AGC output
IC 3-A
G original signal
BGP

Fig. 1-4-8

The original G signal (+) and 1H delayed signal (−) are input to the level comparator, which amplifies and outputs the difference signal. As Q18 and Q19 are supplied with the black gate pulse (BGP), the gate opens during this period (3H or 3.5H in the V. BLK period) so as to output the difference signal of the pilot pulse which has been added to the original signal. The difference signal is integrated by C29 to DC voltage, which is provided to the AGC amplifier circuit to control the level of the 1H delayed signal output at the same level as the original input G signal.

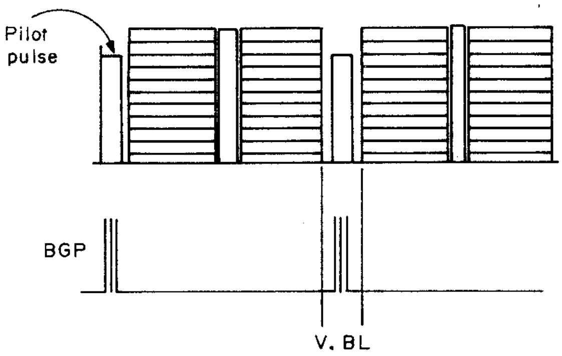

Pilot pulse
BGP
V. BL

Fig. 1-4-9

A 2H delayed signal is generated by the same method as the 1H delayed signal. The contour signal is obtained by the mixing circuit shown below.

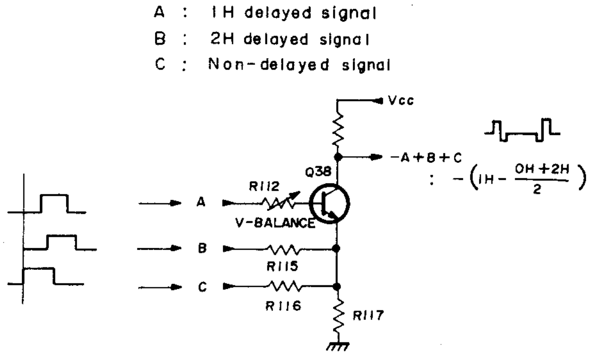

A : 1H delayed signal
B : 2H delayed signal
C : Non-delayed signal
Vcc
-A+B+C
: -(1H - (0H+2H)/2)
R112
Q38
V-BALANCE
R115
R116
R117
A
B
C

Fig. 1-4-10

Although the Q38 output is a negative (−) contour signal, it is inverted by the level dependent circuit described later to become a normal contour signal.

1.4.2 Horizontal contour signal generator

The vertical contour signal generator circuit uses a mixed signal consisting of the 1H and 2H delayed signals generated at the vertical contour signal generator circuit and the original G signal (0H + 1H + 2H). The mixing is performed using a comb filter, which reduces random noise included in the contour signal so that the S/N is improved by approx. 3 dB.

The input signal (non-delayed, 0 H) is inverted at the collector of QA in IC5.

The signal is then passed through DL-3, inverted at the collector of QB, passed through DL-3 again and is returned to the collector of QB. (2H)

On the other hand, the input signal with the same phase (0H), which is at the emitter of QA, is connected with the collector of QA via QB and DL-3. (1H)

In consequence, the contour signal is generated at the collector of QA.

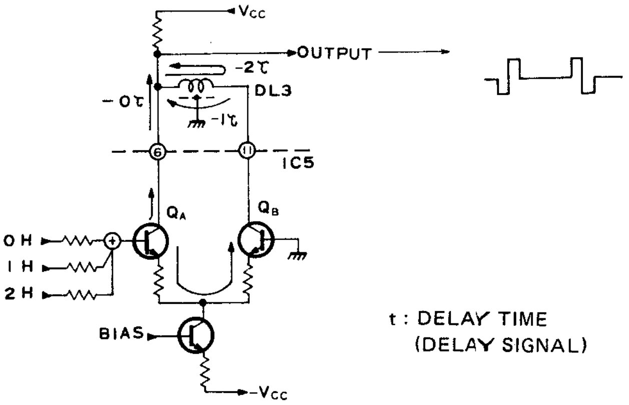

Vcc
OUTPUT
-2τ
DL3
-0τ
-1τ
6
11
IC5
QA
QB
0H
1H
2H
BIAS
-Vcc
t : DELAY TIME
(DELAY SIGNAL)

Fig. 1-4-11

1.4.3 Level dependent correction

Contour correction results in noise in the picture, because the contour is enhanced together with the noise signal. In addition, contour correction is not necessary in darker part of the image which does not stand out in the overall picture.

The level dependent circuit functions so that contour correction is performed only for the video signal amplitude of more than a specified level, not for small amplitude signals.

The horizontal and vertical contour signals are amplified at IC6, an input terminal of which is connected to the FET Q45.

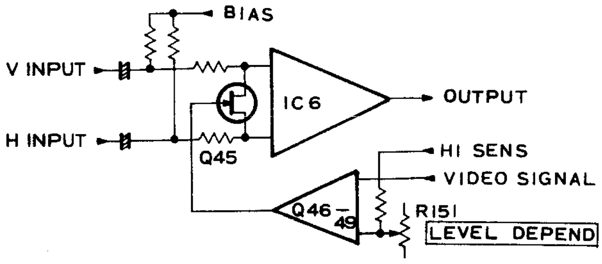


Fig. 1-4-12

Q46 is supplied with the G ch video signal and Q49 specifies the DC voltage corresponding to the amplitude level above which contour correction is necessary.

When the video signal level is below the set value, the drain – source impedance of FET Q45 becomes zero, the input terminal of IC6 becomes the same phase and no signal is output. (Common mode rejection)

The lower limit video signal level value is increased by the voltage control of the HI-SENS control circuit during +9 dB or +18 dB gain boost, because noise is tends to stand out when the gain is boosted.

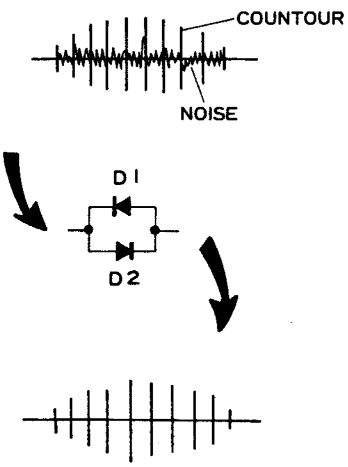


Fig. 1-4-13 Noise slice

With 0 dB gain, the contour correction is not performed when the video signal amplitude is below the 1st step of the JVC gray scale (i.e. a video signal amplitude of 13%).

The contour signals obtained electrically also include noise as shown in the following diagram.

Noise is sliced by passing the signal through a diode with a forward voltage matching the amplitude of the noise signal. A Schottkey diode with small junction capacity is used because of the rejection of high frequency noise.

1.5 DF BOARD

The DF board includes the H and V deflection circuitry.

1.5.1 Horizontal deflection

The R/G/B deflection yokes are connected in parallel to the deflection output circuit. DC current is applied via a filter choke coil to the path going to each deflection coil for centering adjustment. Deflection distortion correction current is applied the returning paths of the B and R coils.

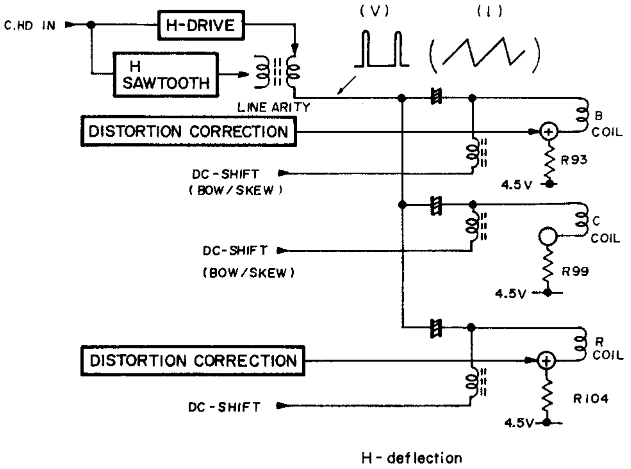

C.HD IN
H-DRIVE
H SAWTOOTH
(V)
(I)
LINE ARITY
DISTORTION CORRECTION
B COIL
R93
DC-SHIFT (BOW/SKEW)
4.5V
C COIL
DC-SHIFT (BOW/SKEW)
R99
4.5V
R COIL
DISTORTION CORRECTION
DC-SHIFT
R104
4.5V
H-deflection

Fig. 1-5-1 H deflection circuit

1) Horizontal deflection
The deflection pulse of 35 Vp-p can be obtained at TP2. The deflection current flows in the horizontal deflection coils following the switching operation of Q11. This deflection current depends on the voltage of the deflection circuit power supply and can be varied with the M.H. AMP circuit.
The normal supply voltage is approx. 3 V and it is switched to 5 to 6 V during overscanning.
D4 is a damper diode.

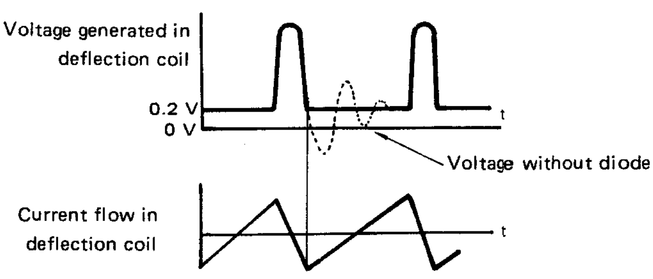


Fig. 1-5-3

1. Horizontal deflection and M. LIN/M. AMP/M PIN correction

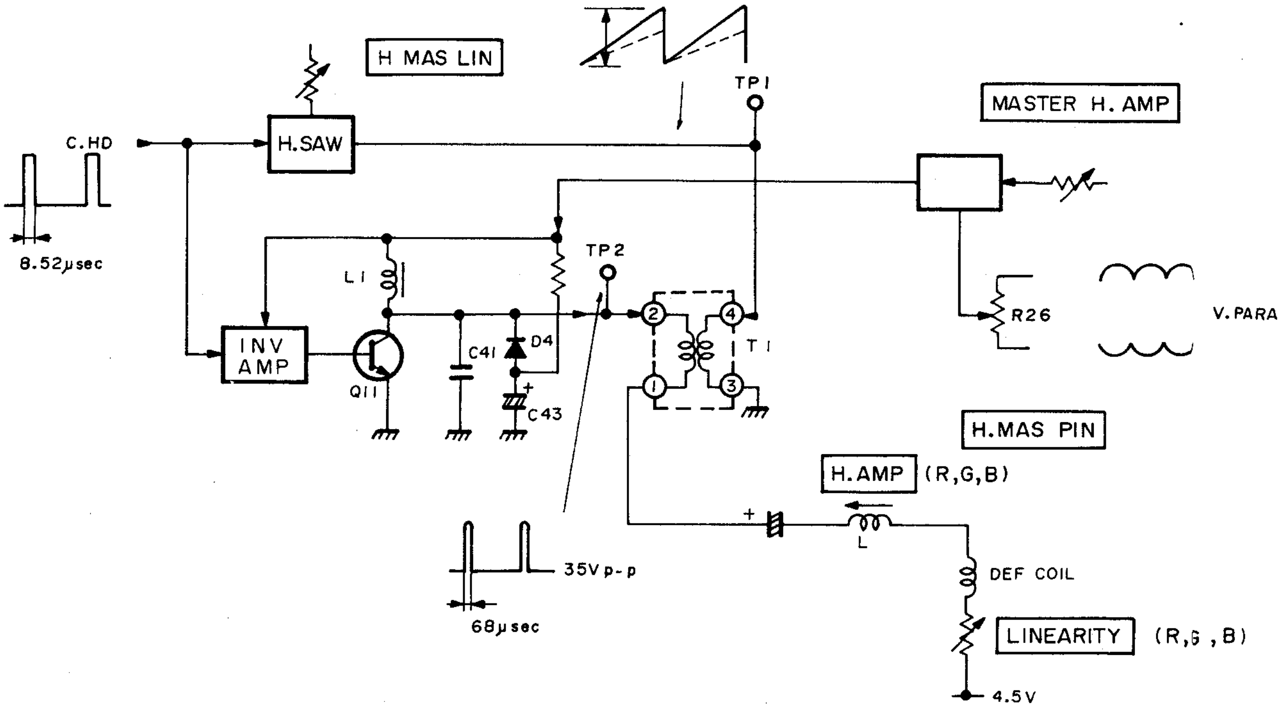

H MAS LIN
TP1
MASTER H. AMP
C.HD
H.SAW
8.52μsec
TP2
L1
INV AMP
Q11
C41
D4
C43
T1
R26
V.PARA
H.MAS PIN
H.AMP (R,G,B)
L
35Vp-p
68μsec
DEF COIL
LINEARITY (R,G,B)
4.5V

Fig. 1-5-2

2) M. LIN correction

A sawtooth signal is generated from C. HD and is superimposed on the deflection pulse via linearity transormer T1. The parabolic correction current is also applied to the deflection coil for linearity correction.

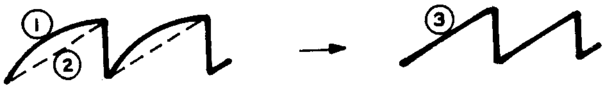


Fig. 1-5-4

To correct the deflection current which is distorted as shown by ① above, a correction current in the reverse direction as shown by ② is supplied from T2 so that the deflection current with distortion compensated as shown by ③ is obtained.

The amplitude of the sawtooth signal, measured at TP1, can be varied with the H. MAS. LIN potentiometer.

The M. LIN adjustment requires a special pattern (ball chart) and crosshatch signal generator.

3) M. H. AMP

The power voltage of the horizontal deflection varies the p-p value of the deflection current so the magnitude of horizontal deflection can be changed.

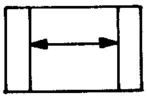


Fig. 1-5-5

4) H. MAS. PIN

Pincushion distortion correction is performed by superimposing a V parabolic signal on the power supply of the horizontal deflection.

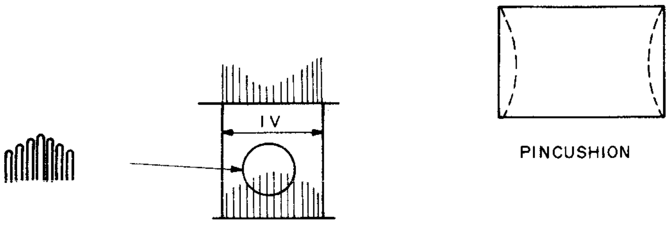


Fig. 1-5-6

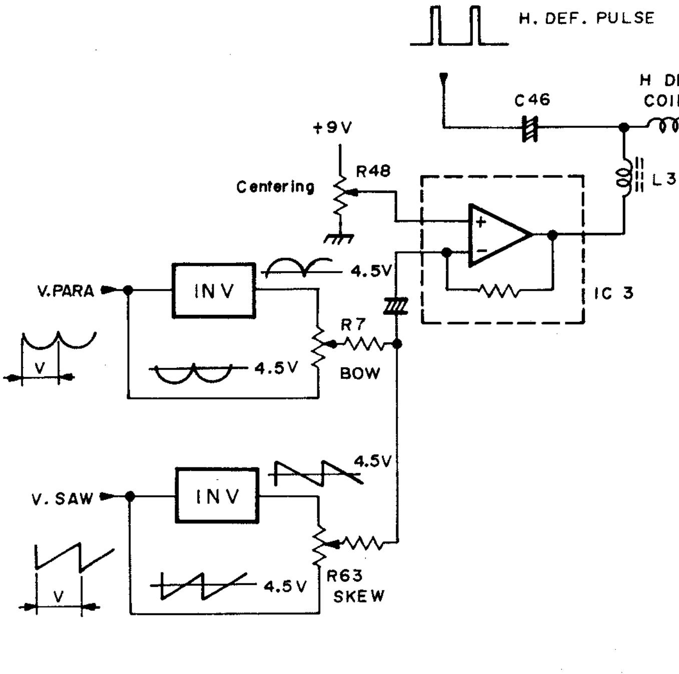
The zoom lens itself is responsible for pincusion or barrel-shaped distortion. As distortion due to the lens is minimized at zooming positions between 20 and 40 mm with the standard lens, correction adjustment should be done with the lens set to the suitable position.

2. Horizontal deflection distortion correction

1) SKEW/BOW correction

Skew correction

Positive and negative V. SAW signals are applied to the two ends of R63 (SKEW). Their amplitude and polarity can be varied as required, and their polarity is reversed using an op-amp. At in the centering circuit, skew distortion can be corrected by superimposing the V. SAW signal on the horizontal deflection coil drive current.



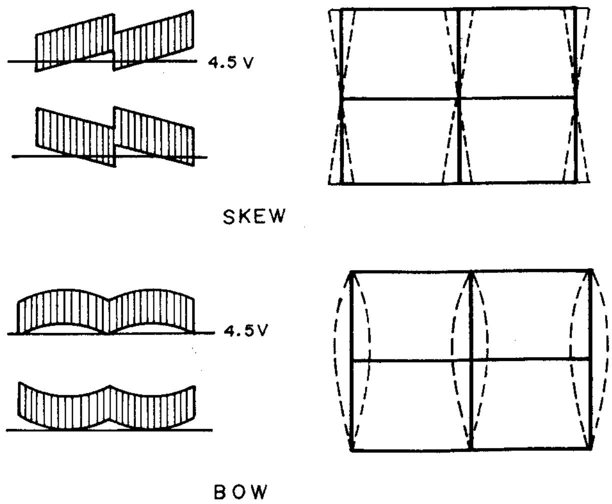
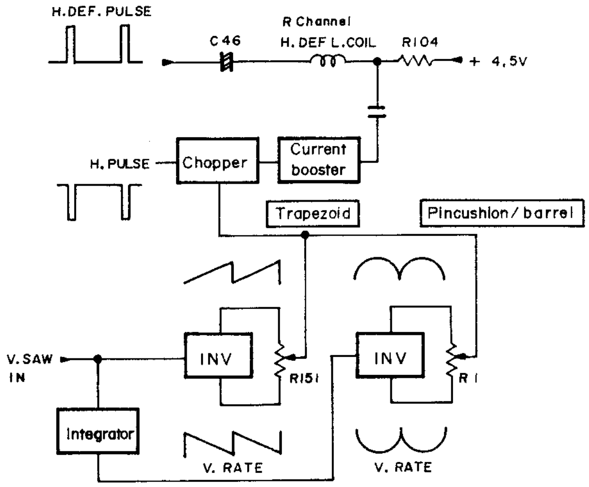


Fig. 1-5-7

Bow correction

Bow distortion correction is a variation of skew correction: bow distortion is corrected by superimposing a V. PARA signal, instead of the V. SAW signal used in skew distortion.

2) TRAPEZOIDAL/PIN correction


H.DEF. PULSE
C46
R Channel
H.DEF L.COIL
R104
+ 4.5V
H.PULSE
Chopper
Current booster
Trapezoid
Pincushion/barrel
V.SAW IN
INV
R151
INV
R I
Integrator
V. RATE
V. RATE

*Example of R ch

Fig. 1-5-8

Trapezoidal correction

V. SAW signal are applied to the two ends of R151 (TRAPE). Their amplitude and polarity can be changed as desired.

The output is then sent to the chopper to modulate the horizontal deflection pulse.

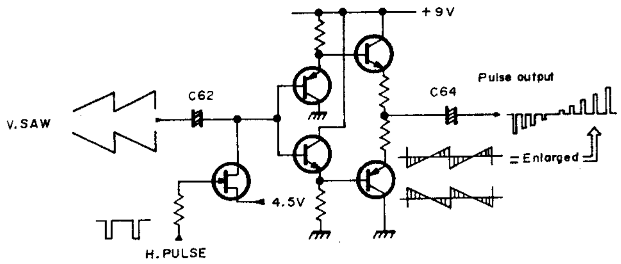

+9V
Pulse output
C62
C64
V.SAW
= Enlarged
4.5V
H.PULSE

Fig. 1-5-9

The modulated (chopped) pulse output has the same phase as the flyback pulse of the horizontal deflection output. As shown in the diagram below, C1 is discharged (or charged) to compensate for (or add) the horizontal deflection power so that the horizontal amplitude is partially changed.

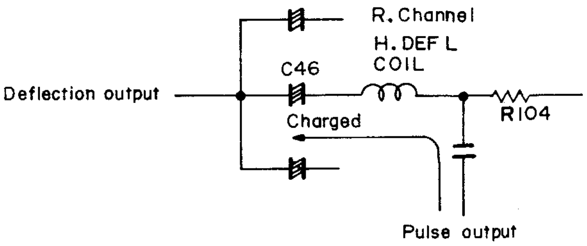

R. Channel
H. DEF L
COIL
C46
Deflection output
Charged
R104
Pulse output

Fig. 1-5-10

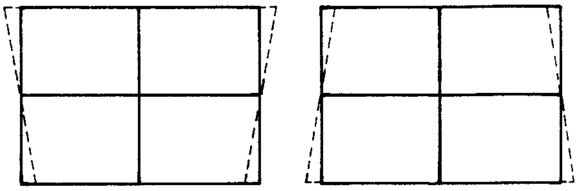


Fig. 1-5-11

Consequently, the raster can be corrected as shown in Fig. 1-5-11 above. This is trapezoidal distortion correction.

Pincushion correction

Positive and negative parabolic signals are applied to the two ends of the PIN/BARREL potentiometer. The parabolic signal (the polarity and amplitude are selected by the potentiometer) is sent to the chopper described previously, modulates the H. PULSE and varies the horizontal deflection amplitude by a similar process.

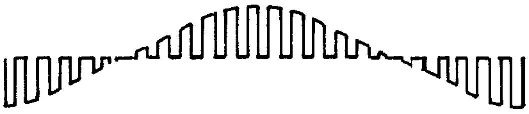
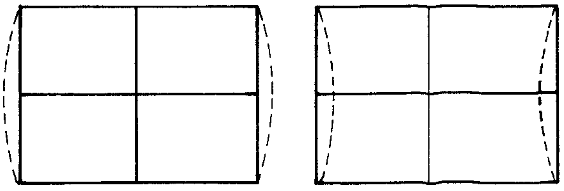


Fig. 1-5-12

The diagram below shows the corrections of pincushion and barrel distortions.



Pincushion distortion correction   Barrel distortion correction

Fig. 1-5-13

1.5.2 Vertical deflection

Each of the R/G/B deflection coils are connected to the corresponding deflection output circuit. The deflection distortion correction signal (V. parabolic signal) and DC current for centering are applied to each deflection drive amplifier input with the deflection sawtooth signal superimposed on them.

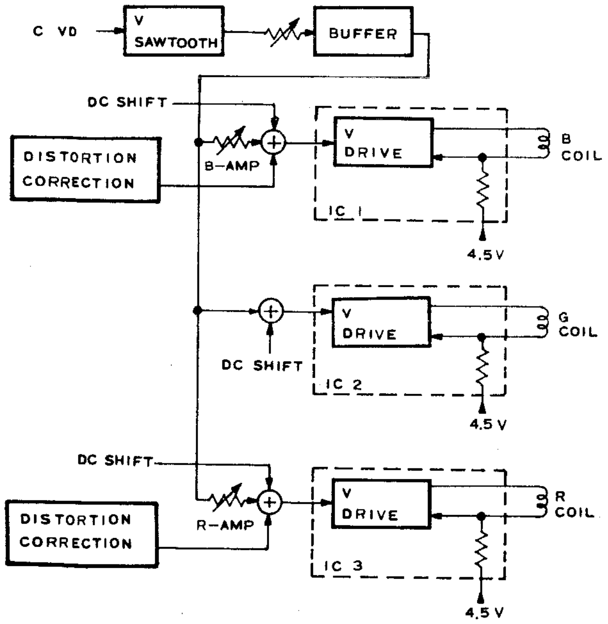

C VD
V SAWTOOTH
BUFFER
DC SHIFT
DISTORTION CORRECTION
B-AMP
V DRIVE
IC 1
B COIL
4.5 V
V DRIVE
IC 2
G COIL
DC SHIFT
4.5 V
DC SHIFT
DISTORTION CORRECTION
R-AMP
V DRIVE
IC 3
R COIL
4.5 V

Fig. 1-5-14

The return paths from the deflection coils are fed back to the drive amps to improve the linearity of the output waveform.

1. Vertical deflection and V. MAS. LIN/V. MAS. AMP
   1) Vertical deflection

The sawtooth signal for vertical deflection is generated from C. VD. The vertical deflection output circuit functions as the constant power supply.

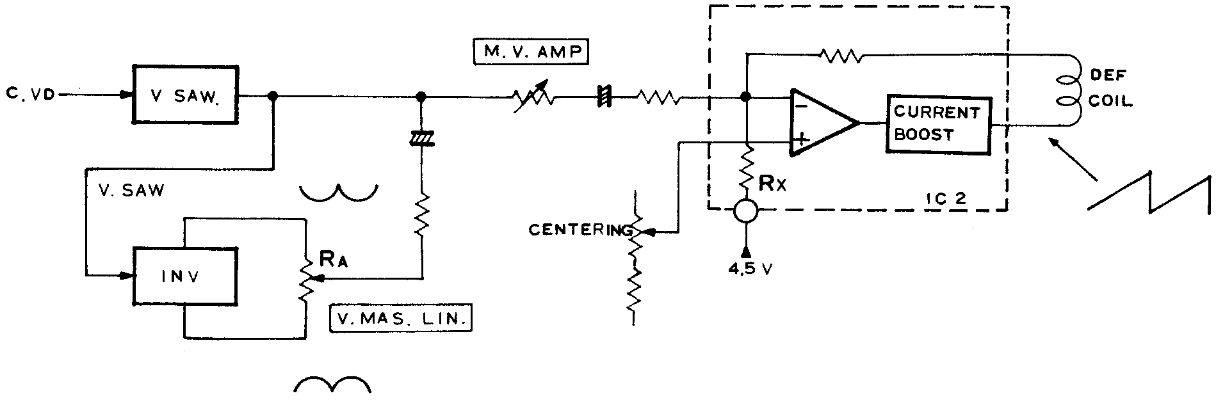

C. VD
V SAW.
M. V. AMP
V. SAW
INV
RA
V. MAS. LIN.
CENTERING
Rx
4.5 V
CURRENT BOOST
IC 2
DEF COIL

Fig. 1-5-15

Rx is the current detection reference resistor, which compares the deflection current in the deflection coil with the input signal and stabilizes the deflection current amplitude when the resistance of the deflection coil varies. The V. SAW signal generated from C. VD is superimposed on the parabolic signal from the V. MAS. LIN (RA) potentiometer for linearity correction.

IC2 supplies the sawtooth signal to the vertical deflection coil.

Adjust V. MAS. LIN and H. M. AMP as in the case of H. MAS. LIN using ball test chart and cross hatch generator.

2. Vertical deflection distortion correction
   1) BOW correction

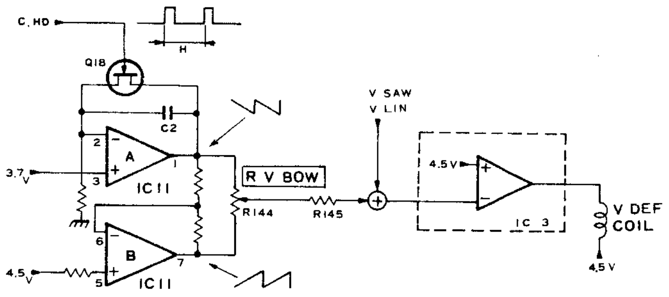

C. HD
H
Q18
C2
2
3
A
1
IC11
3.7 V
6
5
B
7
IC11
4.5 V
R V BOW
R144
R145
V SAW
V LIN
4.5V
IC 3
V DEF COIL
4.5 V

Fig. 1-5-16

The C. HD pulse is integrated with Q18 and IC11-A to generate the sawtooth signal which is inverted by IC11-B. Positive and negative-polarity horizontal sawtooth signals are applied to the both ends of variable resistor R144 (for R channel), the output of which is synthesized with the V. SAW signal for vertical deflection and provided to the deflection coil.

This signal is integrated by the vertical deflection coil which has an inductance of approx. 20 mH and integrated to a parabolic signal which performs the correction shown below.

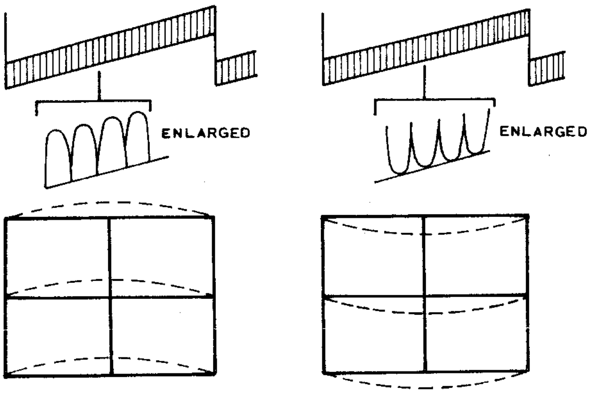

ENLARGED
ENLARGED

Fig. 1-5-17

2) TRAPE/PIN correction

The generator circuit for these corrections is shown with the R channel used as an example.

This IC is a balanced modulator. When the TRAPE (trapezoidal) potentiometer is turned towards ②, the C. HD pulse, inverted from the input, is applied to the both ends of RA. When the potentiometer is turned towards ③, a pulse with the same phase as the input is obtained. The output is zero with the potentiometer at the center position.
The V. SAW wave is input to the base of Q6 to modulate the C. HD pulse described above.
The diagram on the next page shows the waveform outputs obtained from pin ⑦.

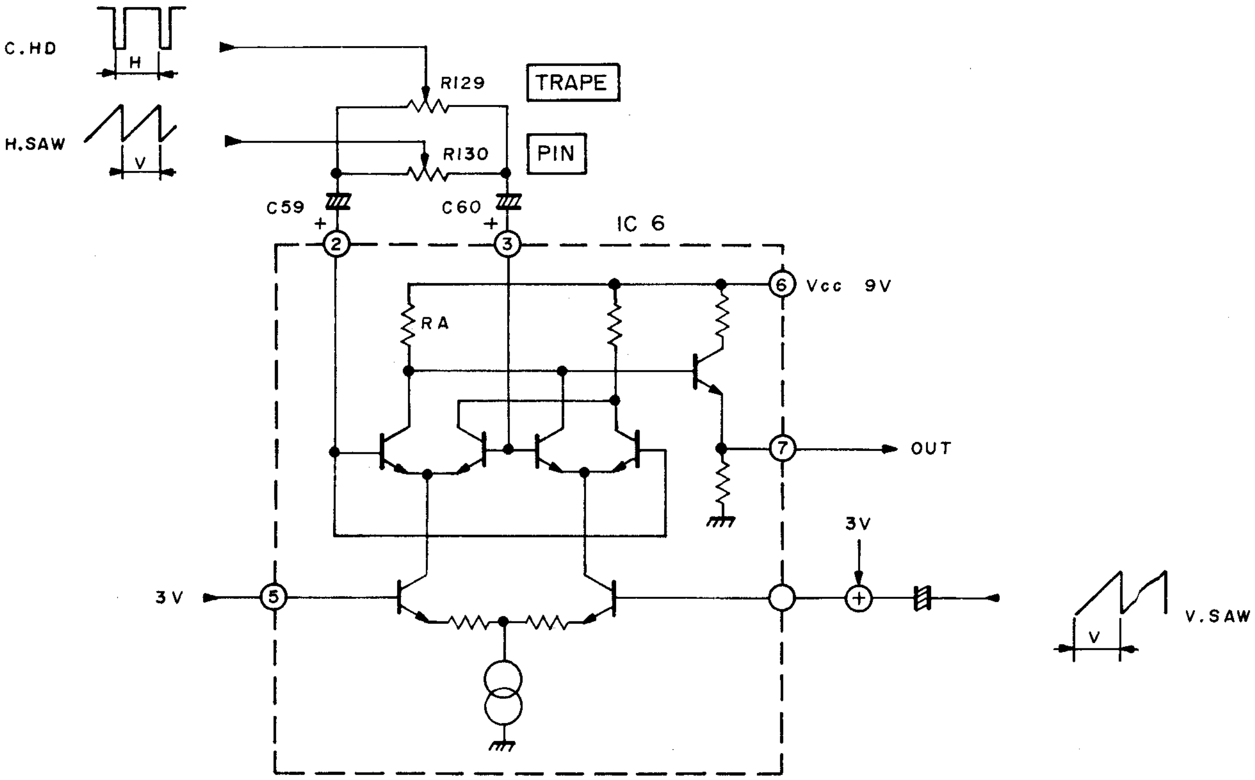

C.HD
H
H.SAW
V
R129
TRAPE
R130
PIN
C59
+
C60
+
IC 6
2
3
6
Vcc 9V
RA
7
OUT
3V
3V
5
+
V.SAW
V

Fig. 1-5-18

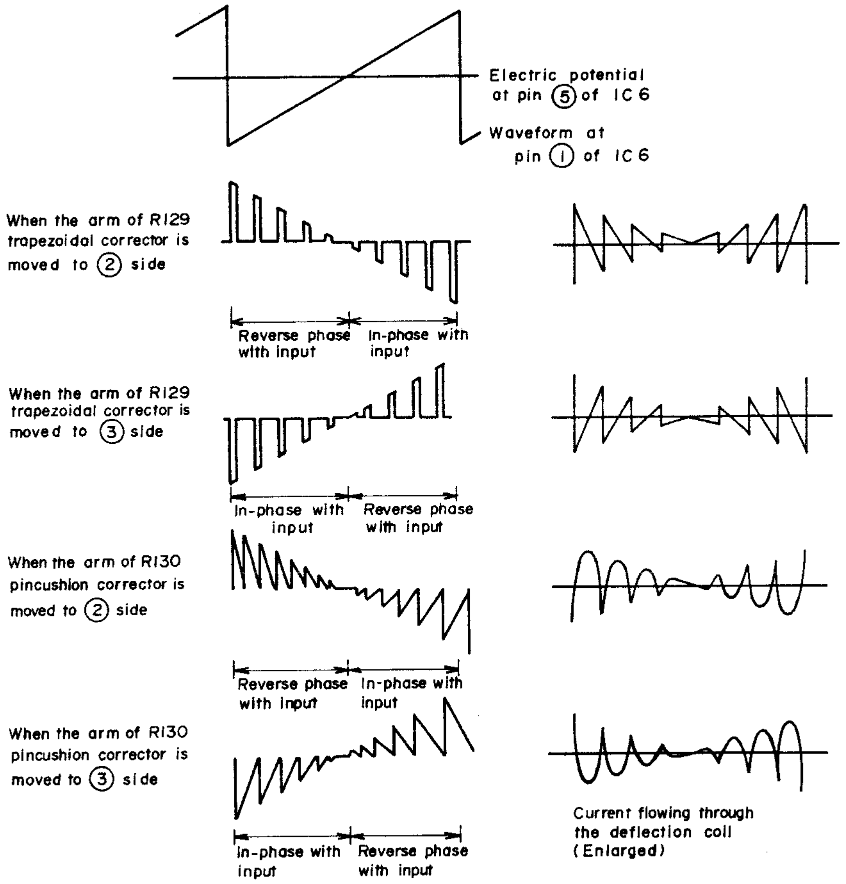

Electric potential at pin ⑤ of IC 6
Waveform at pin ① of IC 6
When the arm of R129 trapezoidal corrector is moved to ② side
Reverse phase with input
In-phase with input
When the arm of R129 trapezoidal corrector is moved to ③ side
In-phase with input
Reverse phase with input
When the arm of R130 pincushion corrector is moved to ② side
Reverse phase with input
In-phase with input
When the arm of R130 pincushion corrector is moved to ③ side
In-phase with input
Reverse phase with input
Current flowing through the deflection coil (Enlarged)

Fig. 1-5-19

These outputs are superimposed on the vertical deflection sawtooth wave and supplied to the deflection coil.

After integration by the deflection coil, the trapezoidal correction wave becomes a sawtooth current and the pincushion correction wave becomes a parabolic wave and the corrections shown in Fig. 1-5-21 are performed.

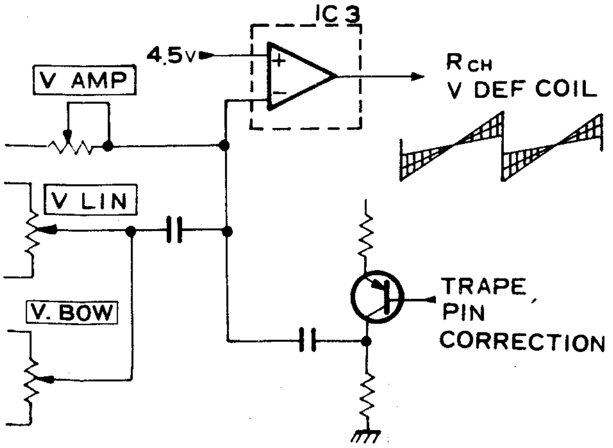

IC 3
4.5V
V AMP
V LIN
V. BOW
RCH
V DEF COIL
TRAPE, PIN CORRECTION

Fig. 1-5-20

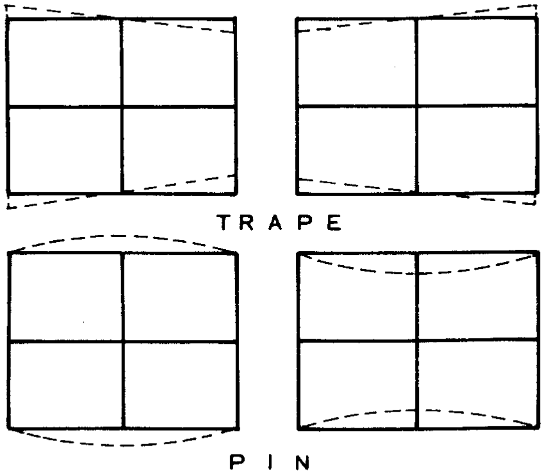


Fig. 1-5-21

1.6 SE BOARD (NTSC)

The SE board includes the following circuits.

1. Sync signal generator (SSG) circuit
2. Genlock circuit
3. Color encoder circuit
4. Color bars generator circuit

1.6.1 Sync signal generator

1. SSG LSI
   This is a 44-pin flat-package C-MOS LSI which also incorporates the color bars generator.
   Two clock oscillator for generation of TV sync signals are provided: a 4 x f sc clock and a 910 f h clock (for NTSC, 282 f h for PAL).
   The H/V sync pulses are generated by counting down 4 f sc so interleaved sync signals can be obtained (internal sync).
   In genlock operation, these clock oscillators are phase controlled by the external SC and external sync pulses (phase comparison – voltage-controlled oscillation).
2. Sync signal pulse
   The timing chart of the sync signal generated from the SG board is shown in Fig. 1-6-1 and 1-6-2.
   Adjustment should be performed so that the timing is as shown in this chart.
3. Blanking width
   The H/V blanking widths are variable in three steps using switches (H. BL, V. BL) on the SG board.
   In normal operations, set them to the standard values below.
   H. BL: 156T (approx. 10.95 microseconds)
   V. BL: 20H
   When a signal has been recorded on video tape and edited or processed with a TBC (time base corrector), the blanking widths are increased. Because of this, the blanking widths of the camera output can be set narrower than the standard values at the time of recording.
4. Burst flag pulse
   The burst flag pulse (BFP) has a width of approx. 2.5 μs. Its rise (burst start) and fall (burst stop) timings can be varied. Adjust the front porch width and burst cycles while observing the horizontal sync signal component of the composite video signal output on an oscilloscope.
5. Black gate pulse
   This pulse is used in the contour correction circuitry (CC board) as the gate signal for the AGC circuit.
6. Pilot pulse
   This pulse is used in the contour correction circuitry (CC board) as the AGC reference pulse for the video signal passing through the delay line.

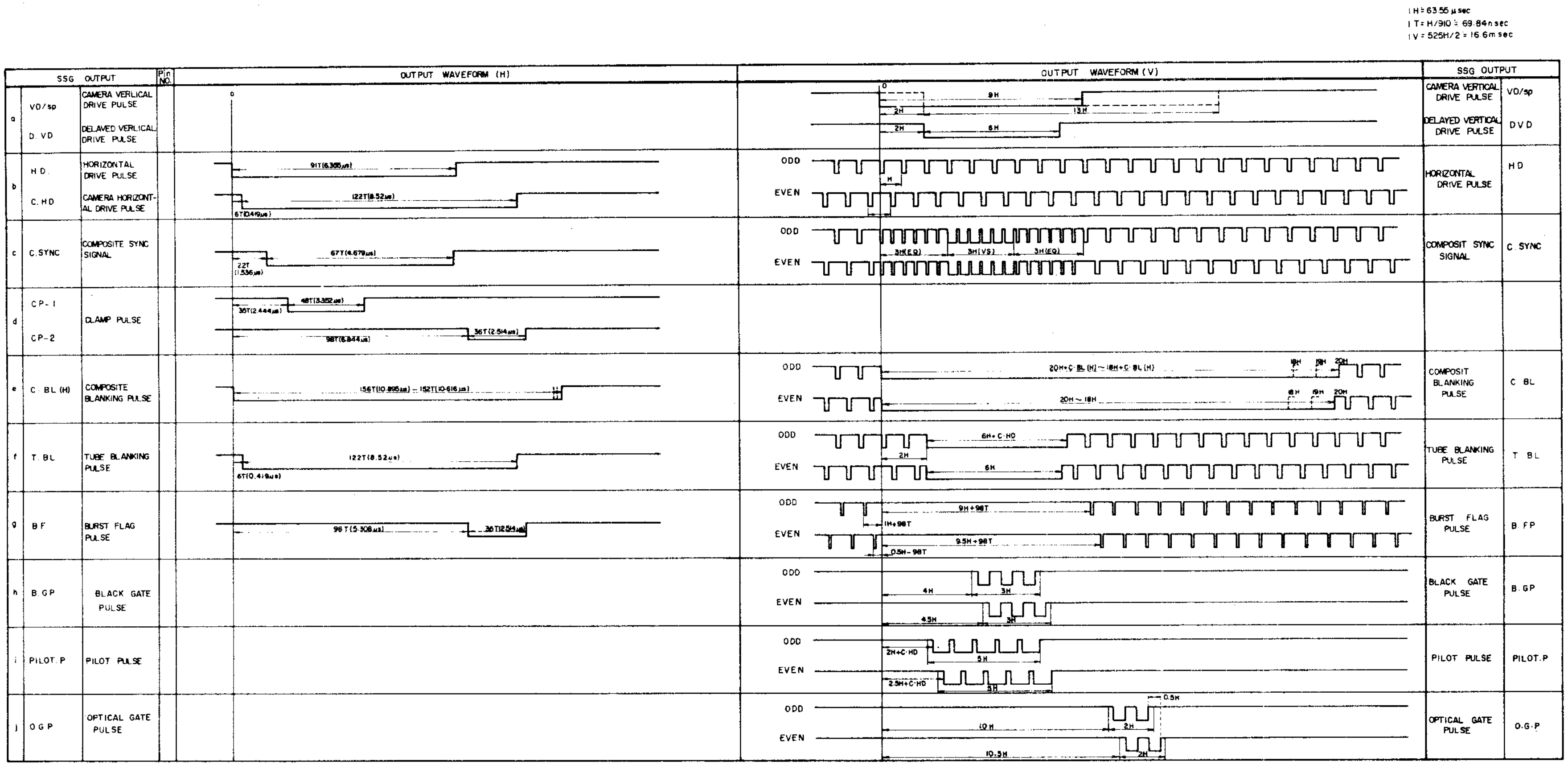

1H ≒ 63.55 μsec
1T = H/910 ≒ 69.84n sec
1V = 525H/2 = 16.6m sec
SSG OUTPUT
Pin NO.
OUTPUT WAVEFORM (H)
OUTPUT WAVEFORM (V)
a
VO/sp
CAMERA VERLICAL DRIVE PULSE
D VD
DELAVED VERLICAL DRIVE PULSE
b
H D.
HORIZONTAL DRIVE PULSE
C.HD
CAMERA HORIZONTAL DRIVE PULSE
c
C.SYNC
COMPOSITE SYNC SIGNAL
d
CP-1
CP-2
CLAMP PULSE
e
C. BL (H)
COMPOSITE BLANKING PULSE
f
T. BL
TUBE BLANKING PULSE
g
BF
BURST FLAG PULSE
h
B.GP
BLACK GATE PULSE
i
PILOT.P
PILOT PULSE
j
OGP
OPTICAL GATE PULSE
0
91T(6.355μs)
122T(8.52μs)
6T(0.419μs)
22T (1.536μs)
67T(4.679μs)
48T(3.352μs)
35T(2.444μs)
36T(2.514μs)
98T(6.844μs)
156T(10.895μs) ~ 152T(10.616μs)
122T(8.52μs)
6T(0.419μs)
96T(5.308μs)
36T(2.514μs)
0
9H
2H
13H
2H
6H
ODD
EVEN
H
3H(EQ)
3H(VS)
3H(EQ)
20H+C·BL(H) ~ 18H+C·BL(H)
18H
19H
20H
20H ~ 18H
6H+C·HD
2H
6H
9H+98T
1H+98T
9.5H+98T
0.5H-98T
4H
3H
4.5H
3H
2H+C·HD
5H
2.5H+C·HD
5H
0.5H
10H
2H
10.5H
2H
CAMERA VERTICAL DRIVE PULSE
VD/sp
DELAYED VERTICAL DRIVE PULSE
DVD
HORIZONTAL DRIVE PULSE
HD
COMPOSIT SYNC SIGNAL
C. SYNC
COMPOSIT BLANKING PULSE
C BL
TUBE BLANKING PULSE
T BL
BURST FLAG PULSE
B. FP
BLACK GATE PULSE
B. GP
PILOT PULSE
PILOT.P
OPTICAL GATE PULSE
O.G.P

Fig. 1-6-1

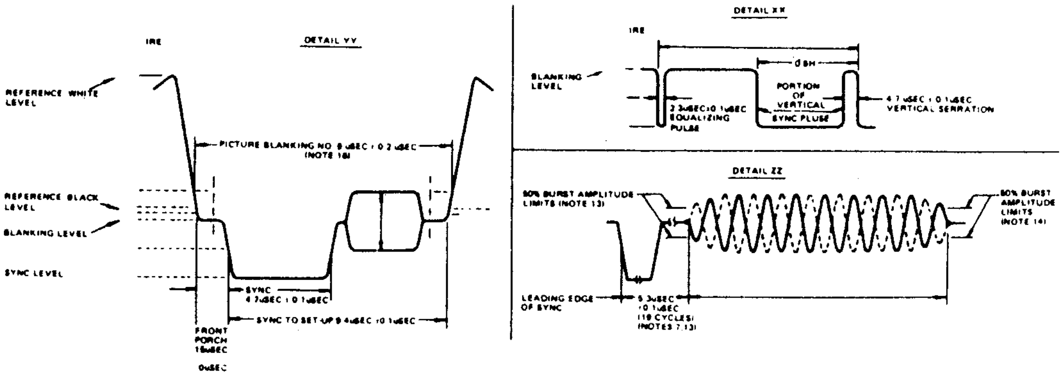

IRE
DETAIL YY
REFERENCE WHITE LEVEL
PICTURE BLANKING 10.9 μSEC ± 0.2 μSEC (NOTE 16)
REFERENCE BLACK LEVEL
BLANKING LEVEL
SYNC LEVEL
SYNC 4.7 μSEC ± 0.1 μSEC
SYNC TO SET-UP 9.4 μSEC ± 0.1 μSEC
FRONT PORCH 1.5 μSEC
0 μSEC
DETAIL XX
IRE
BLANKING LEVEL
0.5H
2.3 μSEC ± 0.1 μSEC EQUALIZING PULSE
PORTION OF VERTICAL SYNC PLUSE
4.7 μSEC ± 0.1 μSEC VERTICAL SERRATION
DETAIL ZZ
80% BURST AMPLITUDE LIMITS (NOTE 13)
80% BURST AMPLITUDE LIMITS (NOTE 14)
LEADING EDGE OF SYNC
5.3 μSEC ± 0.1 μSEC (19 CYCLES) (NOTES 7,13)

Fig. 1-6-2 H sync signal

7. Color framing pulse

In the NTSC broadcast format, the timing of the SC phase and V sync signal returns to the original in 2 frames, and the SC phase is different by 180° for each frame. (4-field sequence)

With equipment in which the signal phases are determined in frame units such as video recorders and time base controllers, front porch shift occurs when sync signal is established in switching with a different frame order, even when the front porch of the sync signal and burst SC phase match the standard.

To prevent above, the camera outputs frame marker pulses only on the 1st color fields, not on the 2nd, 3rd and 4th color fields.

The marker pulses are sent to the recorder's CFP input terminal so that 3H pulses are recorded on the timing track in accordance with the rise of the V sync of the 1st fields.

These field pulses are used in editing when certain recorders are used, so that switching can be done between fields with the same number.

The color framing pulse is output during the camera's internal sync operation but, in genlock operation, IC12-A cuts it off: all phase relationships including field numbers becomes dependent on the external reference signal.

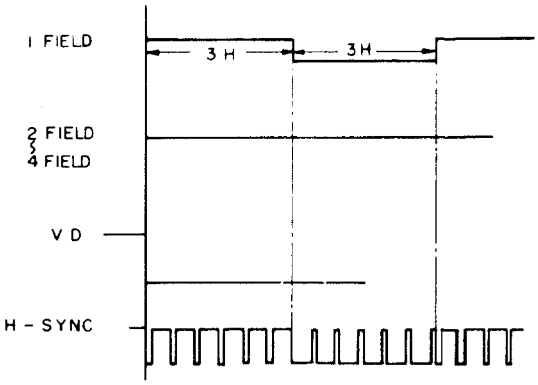

I FIELD
3 H
3 H
2 FIELD
~
4 FIELD
V D
H - SYNC

Fig. 1-6-3 Color framing pulse

1.6.2 Genlock

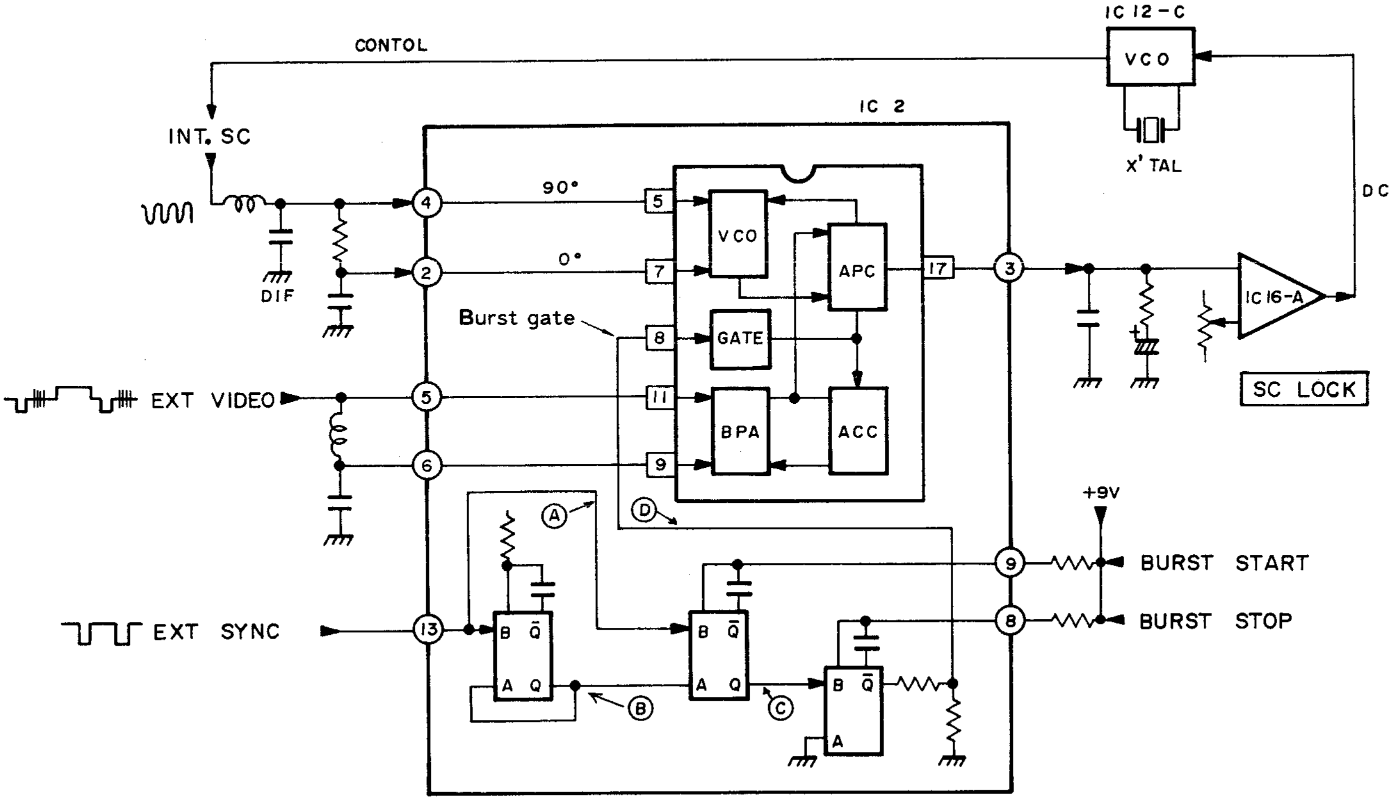

CONTOL
IC 12-C
VCO
X'TAL
DC
IC 2
INT. SC
DIF
90°
0°
5
7
8
9
11
17
VCO
APC
GATE
BPA
ACC
Burst gate
4
2
5
6
3
9
8
13
IC 16-A
SC LOCK
EXT VIDEO
EXT SYNC
+9V
BURST START
BURST STOP
A
B
C
D
B
Q̄
A
Q

Fig. 1-6-4

The external VBS/BB genlock reference signal is separated into the burst (including chroma), H sync and V sync signals on the MT1 board and these are sent separately to the SG board.

1. Subcarrier phase

   The composite genlock signal (black burst or composite video) is input at terminal②of the SE board.
   The SC component of the signal is supplied to pins⑤and ⑥of IC2 by the L/C SC filters.
   SC is applied to pins ④and② of IC2 from the internal oscillator.
   The H sync signal generated by sync separation of the external reference signal (MT-1 board, SYNC. SEPA) is supplied to pin ⑬of IC2.
   To extract the burst subcarrier from this H sync signal, a gate pulse is formed as shown in the diagram on the above.

   In IC2, the phases of INT. SC and EXT. SC are compared and the phase difference is output at pin ③.
   The phase difference signal is sent to a filter and, using the output of the control amplifier of IC16-A, is applied to the VCO (X'TAL 2) in IC2 to control the 4 fsc oscillation phase to match the EXT. SC signal.

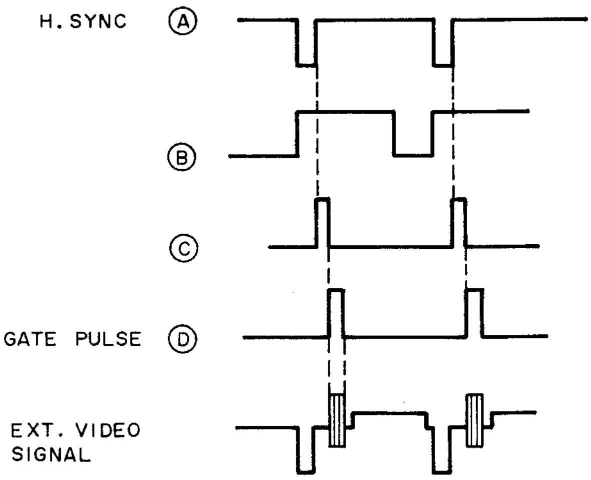

H. SYNC Ⓐ
Ⓑ
Ⓒ
GATE PULSE Ⓓ
EXT. VIDEO SIGNAL

Fig. 1-6-5

2. H sync phase

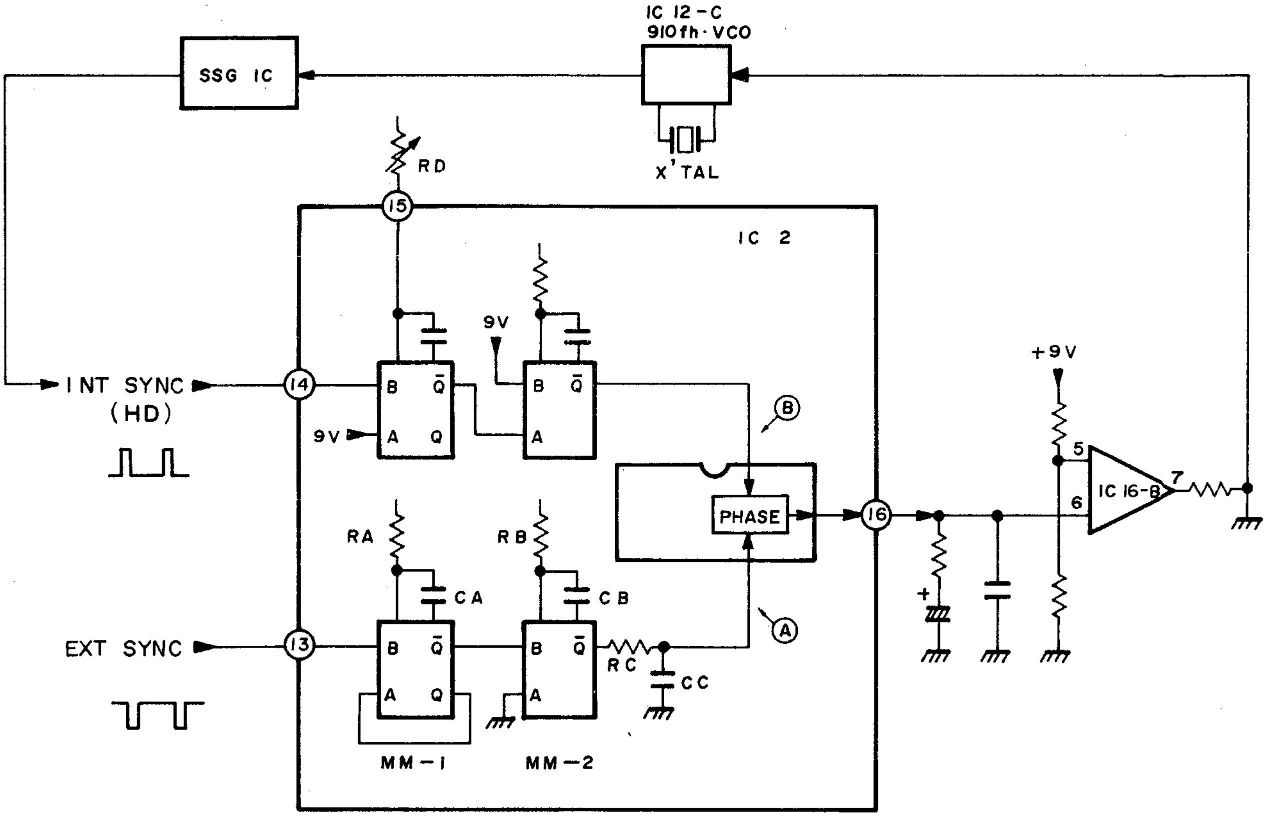

IC 12-C
910fh·VCO
SSG IC
X'TAL
RD
IC 2
9V
+9V
INT SYNC
(HD)
9V
B
Q̄
A
Q
B
Q̄
A
Ⓑ
PHASE
Ⓐ
RA
RB
CA
CB
EXT SYNC
RC
CC
MM-1
MM-2
IC 16-B
5
6
7
+
⑮
⑭
⑬
⑯

Fig. 1-6-6

The H sync pulse (negative polarity) which is sync-separated by IC5 and IC6 on the MT-1 board is input at pin 13 of IC2.

The H sync pulse goes to MM-1 (monostable FF) to the pulse width determine by C_A and R_A. This H pulse is used to drive the monostable FF MM-2 with a pulse width determined by C_B and R_B (2.7 μsec).

(2.7 μsec)

This pulse then becomes a sawtooth wave via the integration circuit consisting of R_C and C_C.

The HD pulse generated by the internal oscillator (the H. LOCK OSC IC12-C for sync pulse generation functions during genlock operation) is also formed into a H pulse for phase comparison by IC2, and its pulse width is varied by R_D (H. PHASE).

In IC2 the phases of INT and EXT signals are detected and the difference is output at pin ⑯.

The output pulse passes through the LPF and enters the IC16-B control amp.

The output pulse is applied to the IC12-C VCO and X'TAL 2 so that the 910 fh clock frequency (phase) controlled to match the EXT. H. phase.

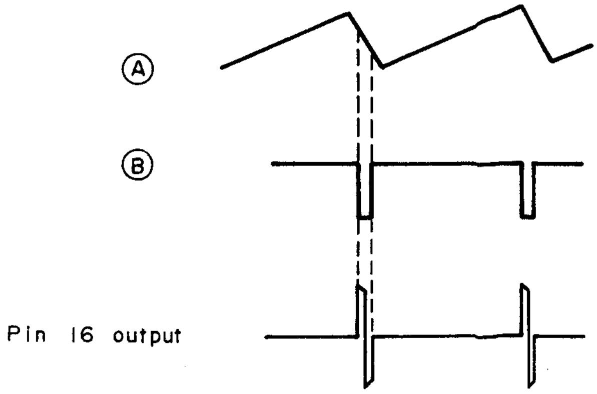
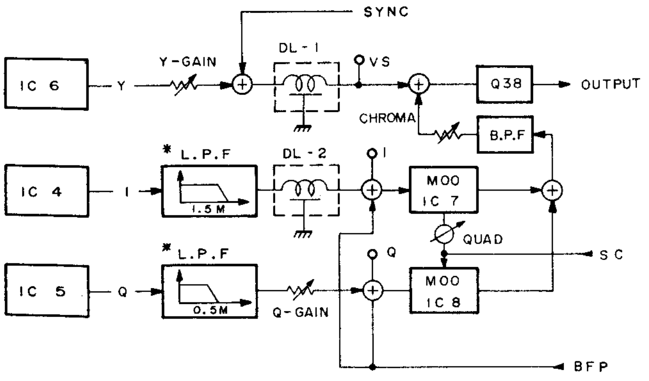

Ⓐ
Ⓑ
Pin 16 output

Fig. 1-6-7

3. V sync phase
The vertical sync phase is reset at the see LSI so that the internal V sync matches the external V sync pulse.
The MT-1 board separates the V pulse from the external genlock signal.
This V pulse reset pin ㉔ of the LSI (with the timing of the fall of pulse) to match the phase.

1.6.3 Color encoder circuit

IC4 incorporates the I signal matrix (0.6R - 0.28G - 0.32B) and IC5 the Q signal matrix (0.52G - 0.21R - 0.31B). The I and Q signals are limited within bandwidths of 1.5 MHz and 0.5 MHz respectively in the IC. This frequency limiting (by LPFs) causes the signals to be delayed.
The delay of the Q signal which is limited within 0.5 MHz is the largest, at approx. 0.62 microsecond.
On the other hand, as the Y signal (0.3R + 0.59G + 0.11B) which is synthesized at IC6 is limited only by the high frequency filter (SC trap) at the collector of Q19, the Y signal timing is faster when compared to the I/Q signals.
These timing errors are matched to the Q signal which has the most delay, using delay line DL-2 for the I signal and delay line DL-1 for the Y signal.
The time differences between the Y/I/Q signals are set around 50 nanoseconds. These time errors are measured at test points provided in each signal.
Color modulator ICs 7 and 8 are supplied with subcarrier signals with phase difference of –90° and 0° respectively, for the amplitude modulations of the I and Q signals.
Just before each of these modulators, a burst pulse BFP is added and becomes the burst flag subcarrier in the output.



*LPFs are incorporated in ICs.

Fig. 1-6-8

The subcarrier signal supplied to the modulator is not continuous and is stopped during blanking periods. (These are called subcarrier blanking periods.)
The Y/I/Q signals are synthesized into the composite video signal by transistor Q38, with their amplitudes are adjusted by Y. LEVEL, Q. GAIN and CHROMA LEVEL (which adjusts both Q and I levels).
Adjust the camera using a vectorscope and color bars signal so that the chroma dots are within the specified frame.

1.6.4 Color bars generator

The color bars signal is a sine wave. IC17 is the counter which counts down this pulse and separates it into B, G and R.

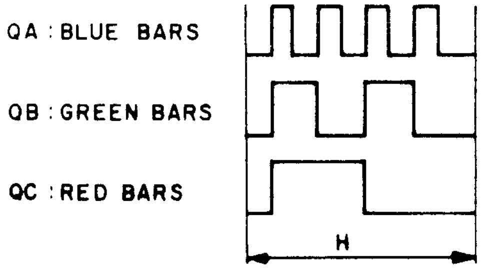


Fig. 1-6-9 Countdown output

The clock pulse for the countdown is supplied from IC2 only when the BARS switch is set to "ON", and has twice the frequency of QA.
However this pulse is not supplied during blanking periods: after each blanking period, the output pulse is always matched with the pulse rise timing because the BFP pulse is applied to the RESET terminal ⑭ of IC17.
The height of the pulse output from IC17 is the same as Vcc, i.e. 5 V.
Blanking processing of the pulse is performed at IC14. IC3 reduces the level and performs DC shifting to obtain a 0 – 1.05 V pulse.
When the BARS switch is set to "ON", the SSG IC generates pulses corresponding to the I and Q bar signals which are supplied to the I and Q matrix ICs.
The bar pulse signals and camera signals are switched by the electronic switch in IC10 and are supplied to the color encoder.
The pulse amplitudes are not adjustable as they are fixed.
Using the color bars, the adjustment of the color encoder circuit can be performed easily and accurately.

1.6 SE BOARD (PAL)

The SE board includes the following circuits.

1. Sync signal generator (SSG) circuit
2. Genlock circuit
3. Color encoder circuit
4. Color bar generator circuit

1.6.1 Sync signal generator

1. SSG LSI

   The color bar primary signal generator is built into a C. MOS type 44-pin flat package LSI.

   There is a clock oscillator used to generate the TV synchronizing signal 282 fh for external synchronization.

   The relationship between subcarrier and pahse/frequency of 282 fh clock oscillator is, based on the standard for PAL-B as follows:

   $$\text{PAL-B: fsc} = (284 - 1/4)\text{fh} + 25\ \text{Hz}$$

   This formula is changed as follows, so that the relation between fsc and fh is always fixed in SSG of this camera.

   $$\text{fsc-25 Hz} = 1135 \times 1/4\text{th}$$

   From each of pin ⑩ , ⑲ of IC1, 25 Hz with a 90 degree phase difference is output. In IC2 and IC3, fsc phase-modulated at 25 Hz, fsc-25 Hz is taken out and is input to pin ⑤, ⑥of IC4.

   Meanwhile, the output of IC1, 1/4 fh pulse, becomes a narrow gate pulse of about the width of 50 nsec. at pin ③ of IC1.

   At FET gate of IC4, the voltage relating deviation of phase of fsc-25 Hz is detected by phase of 1/4th gate pulse (IC4 pin ⑮).

   This voltage, representing the phase variation, controls the CK frequency (282 fh) oscillator.

   LSI IC1 counts down the 282 fh, and generates necessary synchronizing signals.

   IC8 counts down 4 fsc and outputs fsc and 1/4 fsc.

2. Sync signal pulse

   Figs. 1-6-1 and 1-6-2 are timing charts for synchronizing the signal output from the SE PCB.

   Adjustment is necessary to meet the timing shown in the chart.

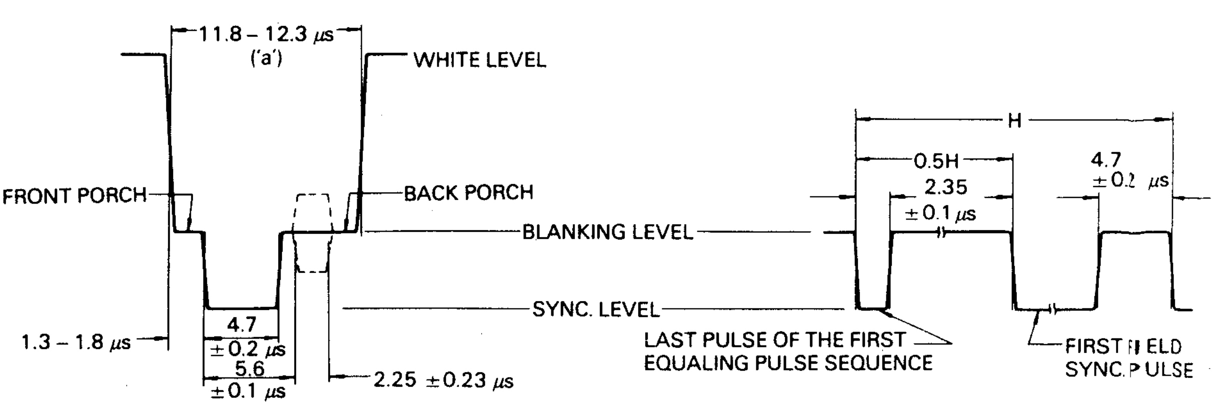

11.8 – 12.3 μs
('a')
WHITE LEVEL
FRONT PORCH
BACK PORCH
BLANKING LEVEL
SYNC. LEVEL
1.3 – 1.8 μs
4.7
±0.2 μs
5.6
±0.1 μs
2.25 ±0.23 μs
H
0.5H
2.35
±0.1 μs
4.7
±0.2 μs
LAST PULSE OF THE FIRST
EQUALING PULSE SEQUENCE
FIRST FIELD
SYNC. PULSE

Fig. 1-6-1 H-sync signal (PAL)

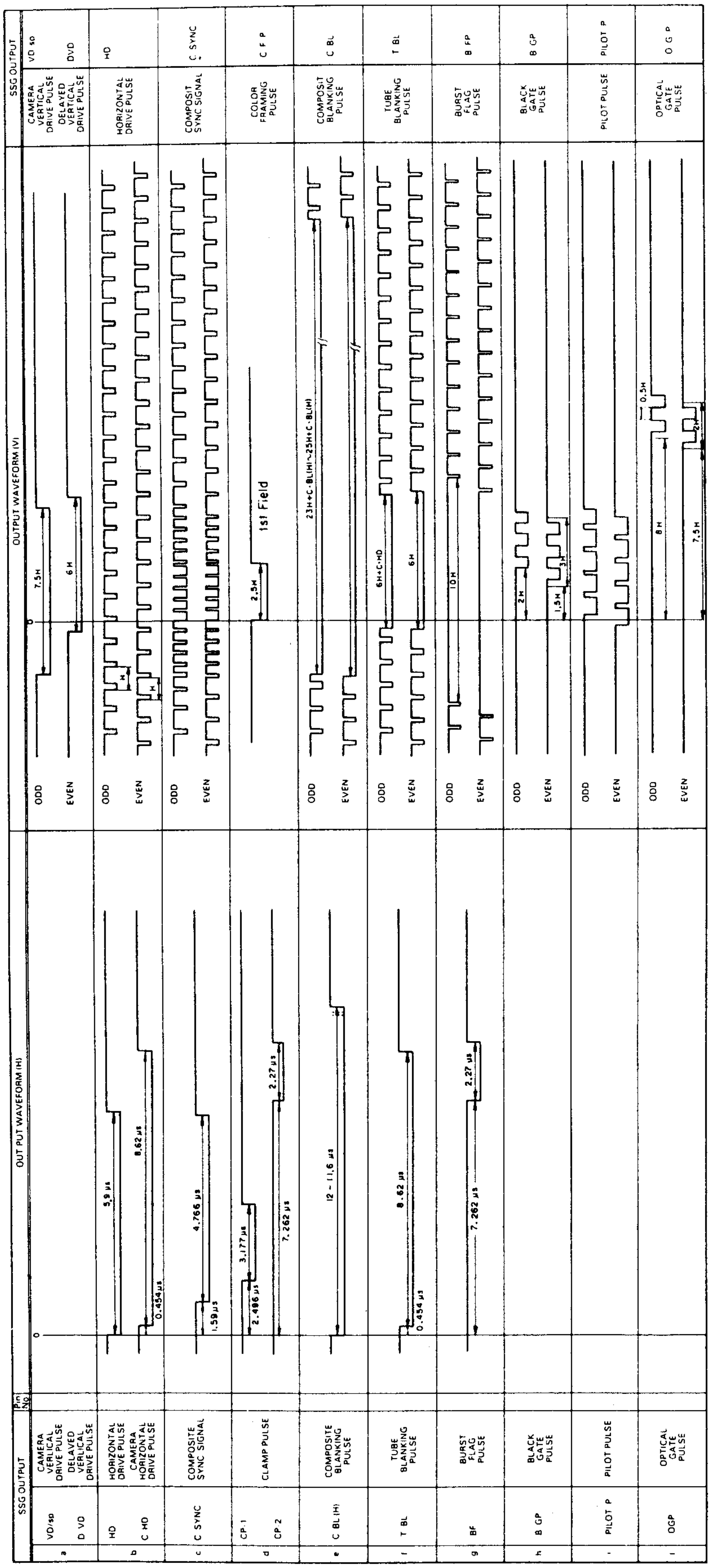

SSG OUTPUT
Pin No
OUT PUT WAVEFORM (H)
OUTPUT WAVEFORM (V)
a VD/sD CAMERA VERTICAL DRIVE PULSE
D VD DELAYED VERTICAL DRIVE PULSE
b HD HORIZONTAL DRIVE PULSE
C HD CAMERA HORIZONTAL DRIVE PULSE
c C SYNC COMPOSITE SYNC SIGNAL
d CP 1 CP 2 CLAMP PULSE
e C BL (H) COMPOSITE BLANKING PULSE
f T BL TUBE BLANKING PULSE
g BF BURST FLAG PULSE
h B GP BLACK GATE PULSE
i PILOT P PILOT PULSE
j OGP OPTICAL GATE PULSE
0
5.9 µs
8.62 µs
0.454 µs
4.766 µs
1.59 µs
3.177 µs
2.486 µs
7.262 µs
2.27 µs
12 - 11.6 µs
8.62 µs
0.454 µs
7.262 µs
2.27 µs
ODD
EVEN
7.5H
6H
H
2.5H
1st Field
23H+C.BL(H)~25H+C.BL(H)
6H+C.HD
6H
10H
2H
1.5H
3H
0.5H
8H
7.5H
2H
CAMERA VERTICAL DRIVE PULSE VD sD
DELAYED VERTICAL DRIVE PULSE DVD
HORIZONTAL DRIVE PULSE HD
COMPOSIT SYNC SIGNAL C SYNC
COLOR FRAMING PULSE C F P
COMPOSIT BLANKING PULSE C BL
TUBE BLANKING PULSE T BL
BURST FLAG PULSE B FP
BLACK GATE PULSE B GP
PILOT PULSE PILOT P
OPTICAL GATE PULSE O G P

Fig. 1-6-2 (PAL)

3. Blanking width

   The H/V blanking widths are variable in three steps using switches (H. BL, V. BL) on the SE board.

   In normal operations, set them to the standard values below.

   H. BL: 53H (approx. 12 microseconds)
   V. BL: 25H

   When a signal has been recorded on video tape and edited or processed with a TBC (time base corrector), the blanking widths are increased. Because of this, the blanking widths of the camera output can be set narrower than the standard values at the time of recording.

4. Burst flag pulse

   The burst flag pulse (BFP) has a width of approx. 2.2 μs. Its rise (burst start) and fall (burst stop) timings can be varied. Adjust the front porch width and burst cycles while observing the horizontal sync signal component of the composite video signal output on an oscilloscope.

5. Black gate pulse

   This pulse is used in the contour correction circuitry (CC board) as the gate signal for the AGC circuit.

6. This pulse is used in the contour correction circuitry (CC board) as the AGC reference pulse for the video signal passing through the delay line.

7. Color framing pulse

   In the PAL standard system, the rising phase of SC and the timing of the vertical synchronizing signal come back to the original condition in the fourth frame, and the phase of SC is 180 degrees different for each frame (called 8-field sequence).

   With any device (incl. TBC) setting the signal phase in frame units when recording on a VTR, even if the front edge synchronization and the phase of burst SC meet the respective reference values, the front porch fluctuates when the synchronization is changed by disturbance of the frame.

   To prevent this phenomenon, the frame marker pulse is sent to only the 1st field from the camera (not to 2nd, 3rd to 8th fields).

   When this pulse coincides with the rising V. SYNC of the 1st field during recording, after being sent to CFP input terminal of the VTR, the 2.5H pulse is recorded on the timing track.

   When editing with some VTR's the field pulse performs the switching operation on the field with the corresponding number. The color framing pulse (CFP) is output during the internal synchronization of the camera, but the pulse is cut off by IC20-A during external genlocking. In this case, all relations between the phase including the field number depend on the external reference signal.

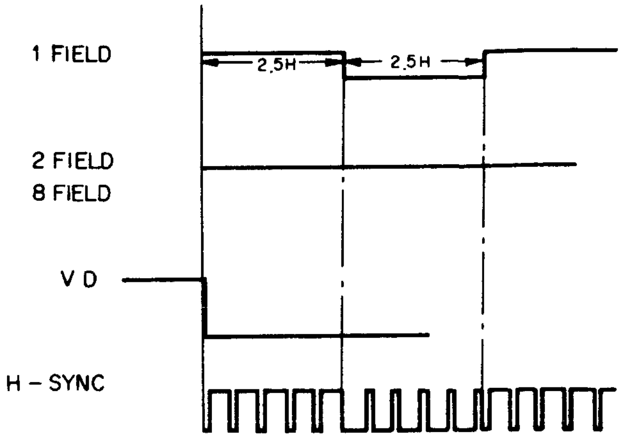


Fig. 1-6-3 Color frame pulse (PAL)

1.6.2 Genlock

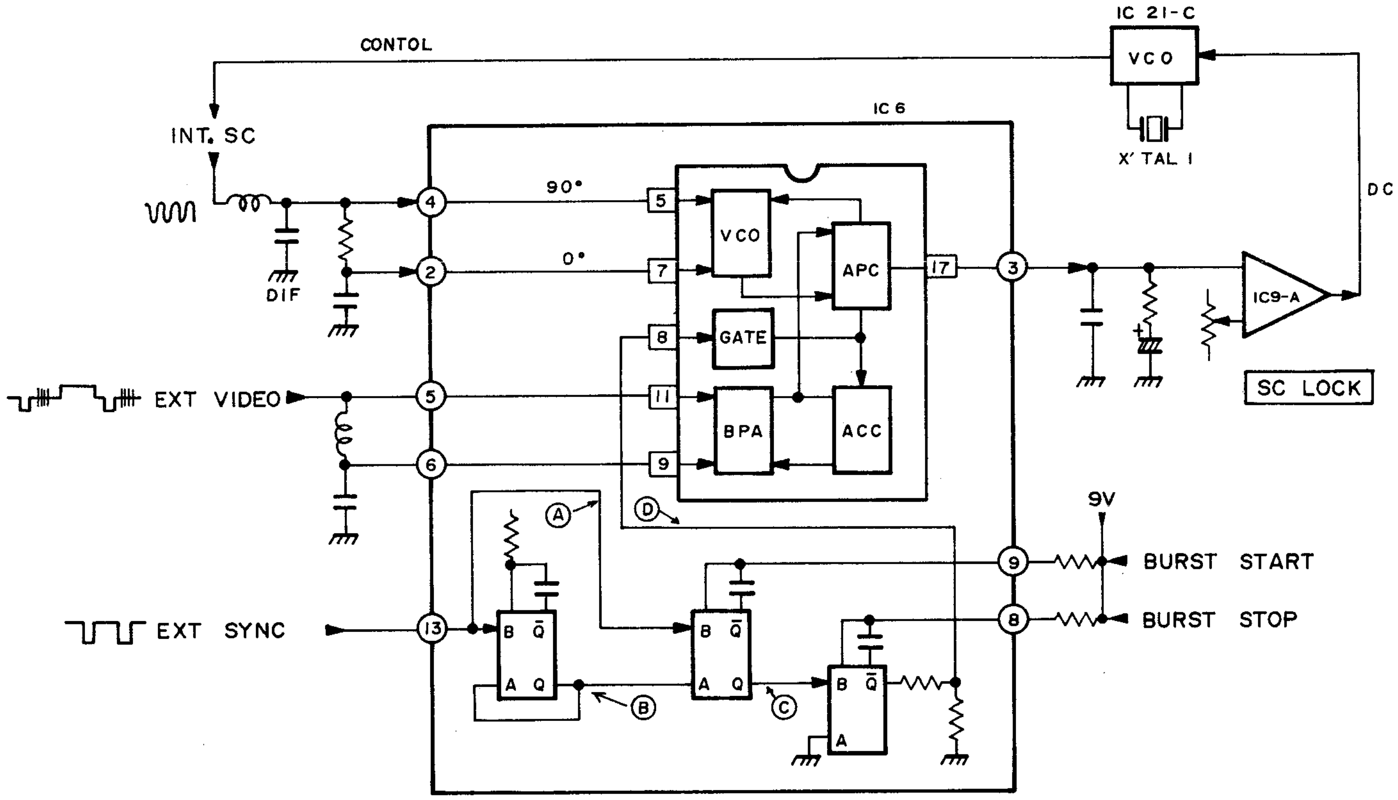

CONTOL
IC 21-C
VCO
X' TAL 1
DC
IC 6
INT. SC
90°
0°
DIF
VCO
APC
GATE
BPA
ACC
IC9-A
SC LOCK
EXT VIDEO
EXT SYNC
9V
BURST START
BURST STOP
4
2
5
6
13
3
9
8
5
7
8
11
9
17
B Q̄
A Q
Ⓐ
Ⓑ
Ⓒ
Ⓓ

Fig. 1-6-4

The external VBS/BB genlock reference signal is separated into the burst (including chroma), H sync and V sync signals on the MT1 board and these are sent separately to the SE board.

1. Subcarrier phase

   The composite genlock signal (black burst or composite video) is input at terminal②of the SE board.
   The SC component of the signal is supplied to pins⑤ and⑥of IC6 by the L/C SC filters.
   SC is applied to pins④and②of IC6 from the internal oscillator.
   The H sync signal generated by sync separation of the external reference signal (MT-1 board, SYNC. SEPA) is supplied to pin ⑬ of IC6.
   To extract the burst subcarrier from this H sync signal, a gate pulse is formed as shown in the diagram on the above.

   In IC6, the phases of INT. SC and EXT. SC are compared and the phase difference is output at pin③.
   The phase difference signal is sent to CR filter and, using the output of the control amplifier of IC9-A, is applied to the VCO (X'TAL1) in IC6 to control the 4 fsc oscillation phase to match the EXT. SC signal.

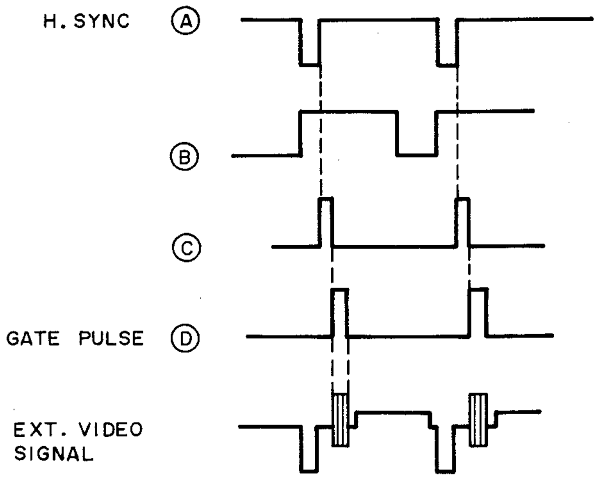

H. SYNC Ⓐ
Ⓑ
Ⓒ
GATE PULSE Ⓓ
EXT. VIDEO SIGNAL

Fig. 1-6-5

2. H sync phase

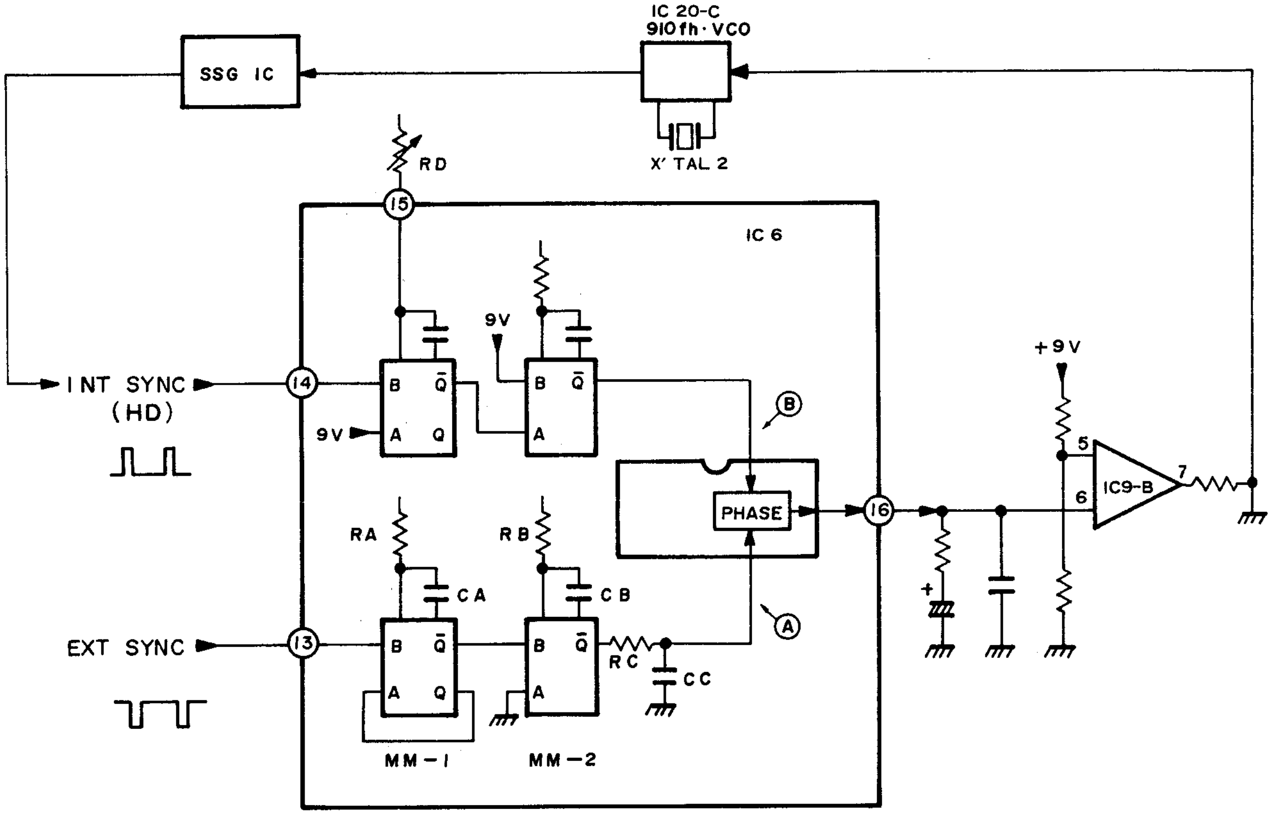

IC 20-C
910fh·VCO
SSG IC
X' TAL 2
RD
⑮
IC 6
9V
+9V
INT SYNC
(HD)
⑭
B
Q̄
A
Q
9V
Ⓑ
PHASE
⑯
5
6
7
IC9-B
RA
RB
CA
CB
EXT SYNC
⑬
RC
CC
Ⓐ
MM-1
MM-2

Fig. 1-6-6

The H sync pulse (negative polarity) which is sync-separated by IC5 and IC6 on the MT-1 board is input at pin ⑬ of IC6.

The H sync pulse goes to MM-1 (monostable FF) to determine the pulse width by C_A and R_A. This H pulse is used to drive the monostable FF MM-2 with a pulse width division period determined by C_B and R_B (2.7 microseconds).

This pulse then becomes a sawtooth wave via the integration circuit consisting of R_C and C_C.

The HD pulse generated by the internal oscillator (the H. LOCK OSC IC20-B for sync pulse generation functions during genlock operation) is also formed into a H pulse for phase comparison by IC6, and its pulse width is varied by R_D (H. PHASE).

In IC6 the phases of INT and EXT signals are detected and the difference is output at pin ⑯ .

The output pulse passes through the LPF and enters the IC9-B control amp.

The output pulse is applied to the IC20-B VCO and X'TAL2 so that the 282 fh frequency (phase) is controlled to match the EXT. H. phase.

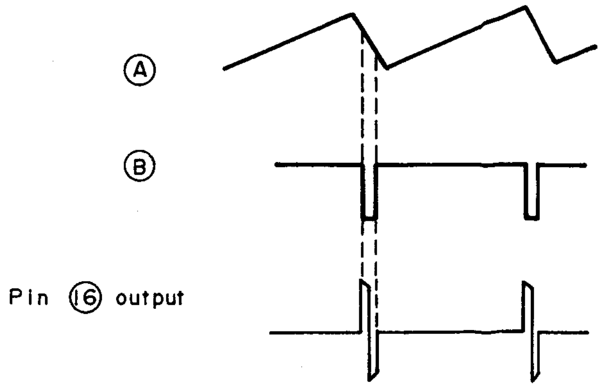

Ⓐ
Ⓑ
Pin ⑯ output

Fig. 1-6-7

3. V sync phase

The vertical sync phase is reset at the SSG LSI so that internal V sync matches the external V sync pulse.
the MT-1 board separates the V pulse from the external genlock signal.
This V pulse resets pin ㉔ of the LSI (with the timing of the fall of pulse) to match the phase.

1.6.3 Color encoder

Matrix resistance is built in as follows:

IC13 V signal $(0.7E_R - 0.59E_G - 0.11E_B) = 0.877 (E_R - E_Y)$

IC15 U signal $(-0.3E_R - 0.59E_G + 0.89E_B) = 0.493 (E_B - E_Y)$

V color signal is range-restricted at 1.3 MHz by Low Pass Filter.
U color signal is range-restricted at 1.3 MHz by Low Pass Filter.
By this range limit circuit, U, V signals are delayed about 0.32 μsec from Y signal. This delay is compensated by delaying Y signal by Delay Line DL-1.

Y signal is compounded by IC12 (resistor matrix).
The collector of transistor Q14 has SC trap of L6, C78. Only at the time of HI-SENS mode (+18 dB), trap of 4.4 MHz comes in, improving the visual noise of the screen.
Each of U, V signals is modulated by the modulator of IC14, 16.
Carrier input of Modulator IC AN614 is through pin ②, ③ and each is an input terminal with reversed phase.

On each input terminal, phase is reversed. Since subcarrier input terminals are switched every 1H, phase is reversed 180° in each line in the modulated color phase. Subcarrier supplied to IC14, 16 is not continuous, and is stopped during blanking time (Subcarrier Blanking). Y signals and Color signals (U, Y signals) are combined at transistor Q40 emitter.

1.6.4 Color bars generator circuit

The color bars signal is a sine wave. IC5 is the counter which counts down this pulse and separates it into B, G and R.

The clock pulse for the countdown is supplied from IC2 only when the BARS switch is set to "ON", and has twice the frequency of Q_A.

However this pulse is not supplied during blanking periods: after each blanking period, the output pulse is always matched with the pulse rise timing because the HD pulse is applied to the RESET terminal ⑭ of IC5.

The height of the pulse output from IC5 is the same as Vcc, i.e. 5 V.

Blanking processing of the pulse is performed at IC19. IC11 reduces the level and performs DC shifting to obtain a 0 – 1.05 V pulse.

The bar pulse signals and camera signals are switched by the electronic switch in IC18 and are supplied to the color encoder. The pulse amplitudes are not adjustable as they are fixed. Using the color bars, the adjustment of the color encoder circuit can be performed easily and accurately.

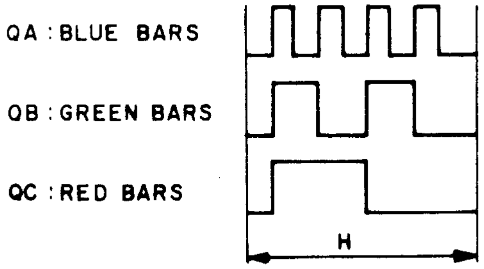


Fig. 1-6-9 Countdown output

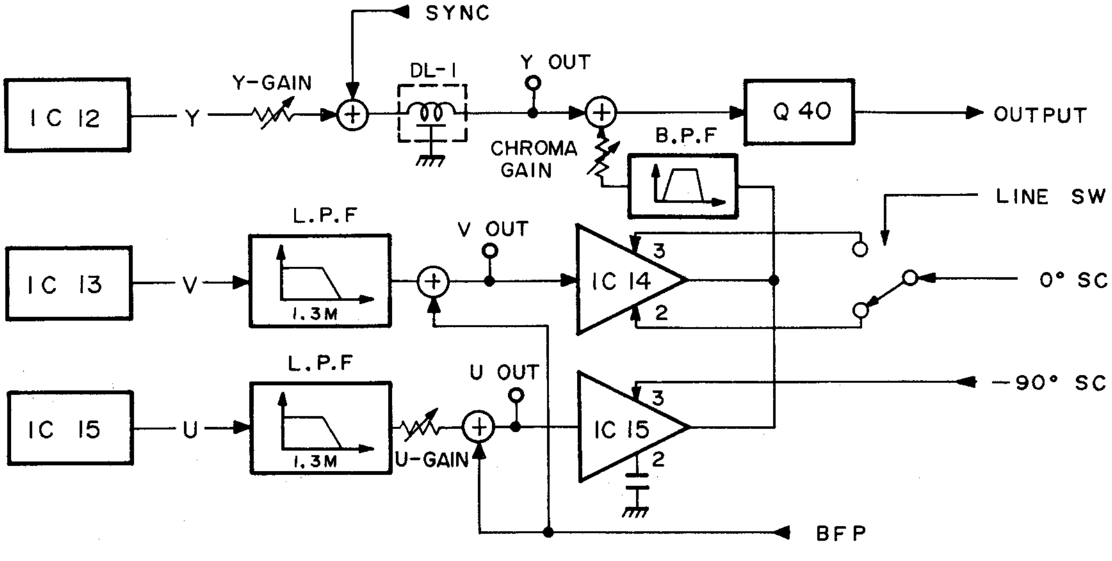


Fig. 1-6-8

1.7 AT BOARD

The AT board includes 8-bit digital automatic adjustment circuits for auto-shift (AS), auto black (AB) and auto white (AW).

1.7.1 Power supply to circuit boards

To save battery, power (+9 V) is only supplied to required parts of the AT board when the AW/AB/AS are not operating. As shown below, power is supplied to the circuit only when the AW/AB or AS switch on the front of the camera is set to "AUTO".

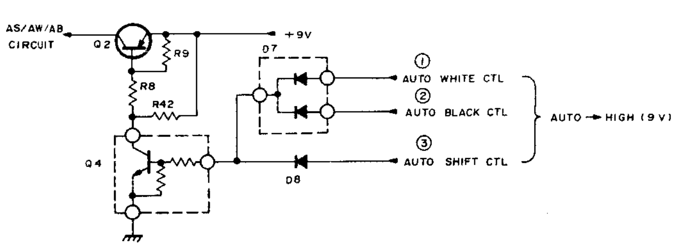

AS/AW/AB CIRCUIT
Q2
R9
+9V
D7
R8
R42
Q4
D8
①
AUTO WHITE CTL
②
AUTO BLACK CTL
③
AUTO SHIFT CTL
AUTO → HIGH (9 V)

Fig. 1-7-1

1.7.2 Area gate signal generator

The differences between the R/G/B signals are detected in the AW/AB/AS operations. This detection is performed at the center of the image, because registration is best and shading is minimum at the center.

The signal which extracts the picture at the center is called the area gate signal. The area gate signal itself is a mixture of horizontal and vertical gate pulses.

The H area gate pulse is generated by IC17-A and the V area gate pulse by IC17-B. These pulses are inverted by Q13 and Q14 respectively.

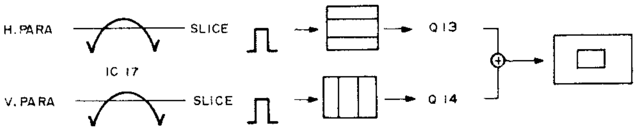

H.PARA
SLICE
IC 17
Q 13
V.PARA
SLICE
Q 14

Fig. 1-7-2

1.7.3 Area gate signal output

During AS/AB/AW adjustment, the camera operator can see the comparison operation from a white frame (area gate signal) in the viewfinder screen.

During comparison for AW/AB, the IC21 output is "H", Q3 is "ON" and Q1 is "OFF". As a result, the control signal of IC4-B becomes "H" and the area gate signal is output.

When the AW/AB setting is complete, the output of IC21 becomes "L", Q3 is turned "OFF" and Q1 is turned "ON". As a result, IC4-B does not output the area gate signal.

The condition in the AS operation is the same.

When the switches are set to "MEMORY" or "MANUAL", IC4-B outputs no signal because no power is supplied (as described in item 1.7.1).

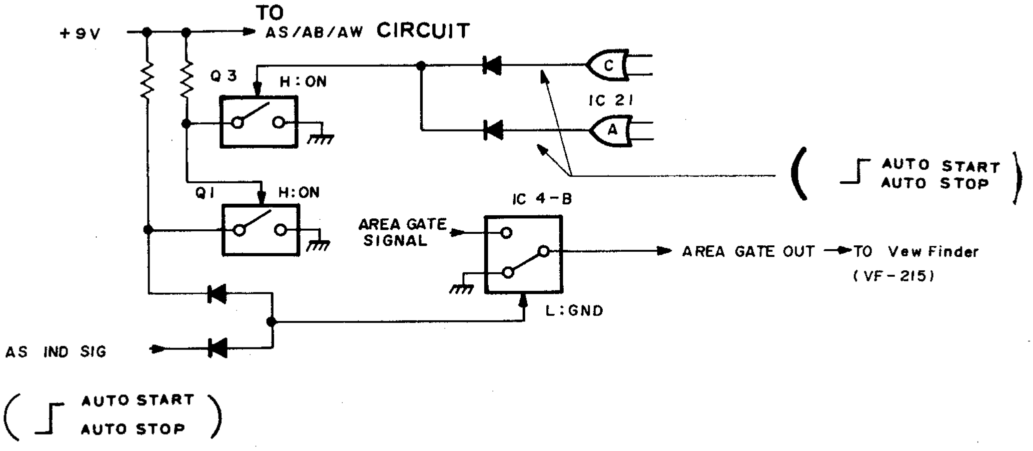

+9V
TO AS/AB/AW CIRCUIT
Q3
H:ON
Q1
H:ON
C
A
IC 21
AUTO START
AUTO STOP
IC 4-B
AREA GATE SIGNAL
AREA GATE OUT → TO Vew Finder (VF-215)
L:GND
AS IND SIG
AUTO START
AUTO STOP

Fig. 1-7-3

1.7.4 Auto-shift registration

The auto-shift circuit corrects the mismatching of the B and R channels with respect to the reference G-channel signal.

This mismatching is detected as an error in the video signal on the time axis. Using an 8-bit counter and D/A converter, this error is minimized by shifting the R/B signals to superimpose them on the G signal.

The auto-shift circuit consists of two circuit boards, the AT-1 and AT-2 boards.

A block diagram of the auto-shift (AS) circuit is shown below. This description takes the relation between the B and G channels as an example.

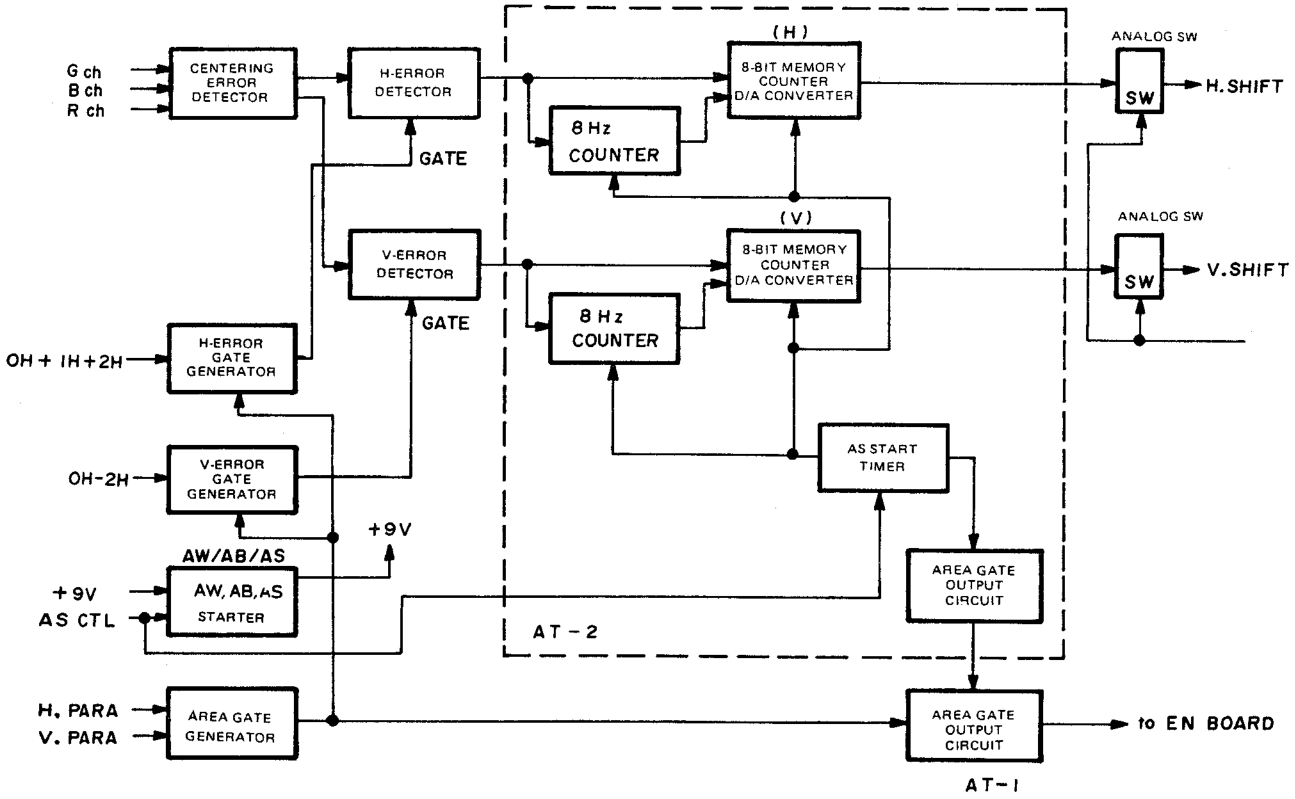
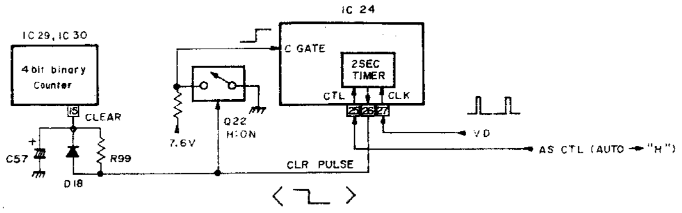

G ch
B ch
R ch
CENTERING ERROR DETECTOR
H-ERROR DETECTOR
GATE
V-ERROR DETECTOR
GATE
OH + IH+2H
H-ERROR GATE GENERATOR
OH-2H
V-ERROR GATE GENERATOR
+9V
AW/AB/AS
+9V
AS CTL
AW, AB, AS STARTER
H. PARA
V. PARA
AREA GATE GENERATOR
(H)
8-BIT MEMORY COUNTER D/A CONVERTER
8 Hz COUNTER
(V)
8-BIT MEMORY COUNTER D/A CONVERTER
8 Hz COUNTER
AS START TIMER
AREA GATE OUTPUT CIRCUIT
AT - 2
AREA GATE OUTPUT CIRCUIT
AT-1
ANALOG SW
SW
H.SHIFT
ANALOG SW
SW
V.SHIFT
to EN BOARD

Fig. 1-7-4

1. Operation timer

When power for the AS circuit is switched on, the operations of the 4-bit binary counter and 8-bit counter are suspended by the operation timer until the power is stabilized.

As described before, the AT board is normally not powered, and power is supplied only when the AS switch is set to "AUTO".



IC 24
IC 29, IC 30
4 bit binary Counter
15
CLEAR
C57
D18
R99
7.6V
Q22
H:ON
C GATE
2SEC TIMER
CTL
CLK
25 28 27
VD
AS CTL (AUTO → "H")
CLR PULSE

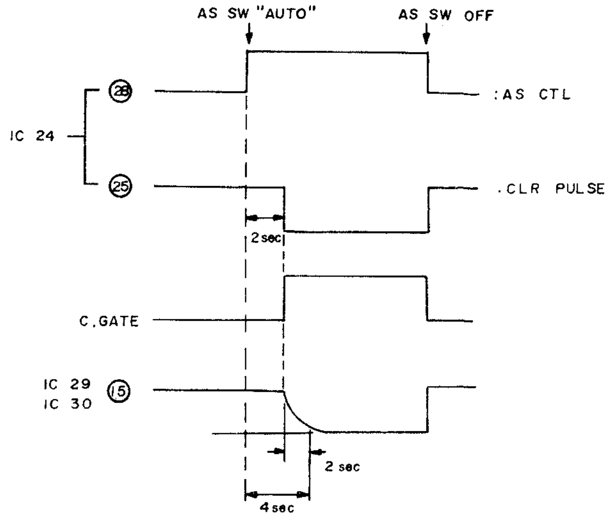
Fig. 7-5 Block diagram of AS operation timer

When the AUTO SHIFT switch on the front of the camera is set to "AUTO", the "H" level is input to pin ㉘ of IC24. When pin ㉔ becomes "H", the 2-sec timer in IC24 counts the clock pulses (VD) at pin ㉗ and, after 2 seconds, changes pin ㉕ 's output from "H" to "L".

As a result, the C. GATE of IC24 turns "H" 2 seconds after the AUTO SHIFT switch is set to "AUTO", and at this time the 8-bit counter starts reading.

The 4-bit counter of ICs 29 and 30 for centering matching detection (the point at which the difference is zero is read 8 times. See item 1.7.5) also starts after approx. 2 seconds through the action of C57 and R99.

The timing chart of these signals is shown in Fig. 1-7-6.



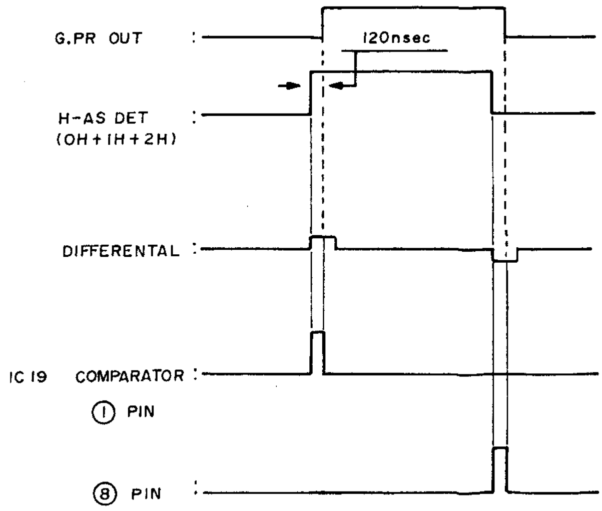
AS SW "AUTO"
AS SW OFF
IC 24
㉘
:AS CTL
㉕
:CLR PULSE
2sec
C.GATE
IC 29
IC 30
⑮
2 sec
4 sec

Fig. 1-7-6

2. Error gate signal generator

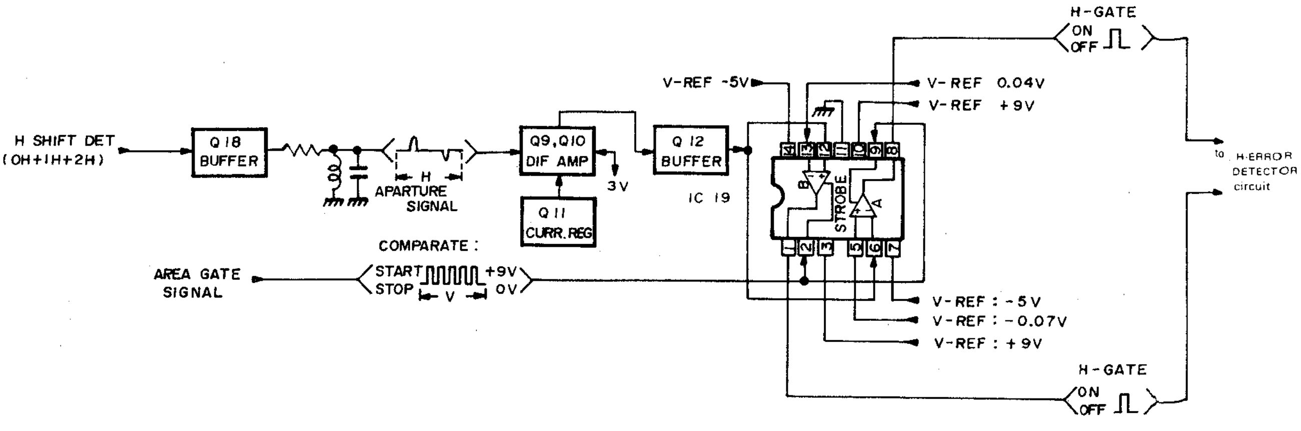
1) Horizontal error gate signal

This is the gate signal for extracting the difference between R and G in the H period.



G.PR OUT
120nsec
H-AS DET
(OH+IH+2H)
DIFFERENTAL
IC 19
COMPARATOR
① PIN
⑧ PIN

Fig. 1-7-8 Horizontal error gate signal



H-GATE
ON
OFF
V-REF -5V
V-REF 0.04V
V-REF +9V
H SHIFT DET
(OH+IH+2H)
Q 18
BUFFER
H
APARTURE
SIGNAL
Q9,Q10
DIF AMP
3V
Q 11
CURR.REG
Q 12
BUFFER
IC 19
STROBE
B
A
to H-ERROR DETECTOR circuit
COMPARATE :
START +9V
STOP 0V
V
AREA GATE
SIGNAL
V-REF : -5V
V-REF : -0.07V
V-REF : +9V
H-GATE
ON
OFF

Fig. 1-7-7 Gate signal generator circuit

2) Vertical error gate signal

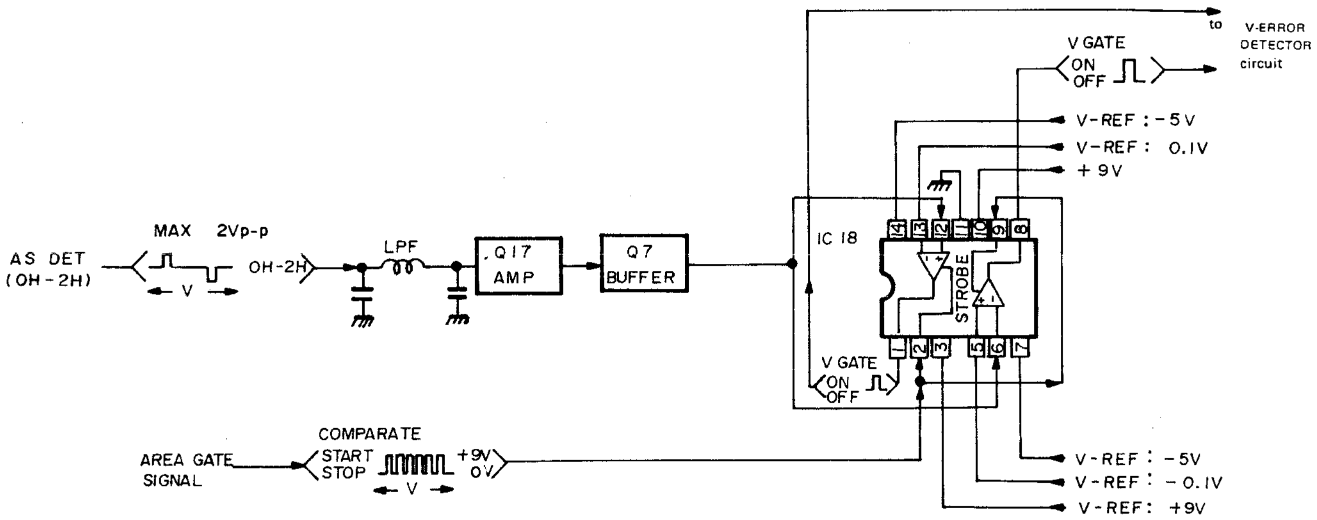

AS DET
(OH-2H)
MAX 2Vp-p
V
OH-2H
LPF
Q17
AMP
Q7
BUFFER
IC 18
STROBE
V GATE
ON
OFF
to V-ERROR DETECTOR circuit
V-REF : -5 V
V-REF : 0.1V
+9V
14 13 12 11 10 9 8
1 2 3 4 5 6 7
AREA GATE SIGNAL
COMPARATE
START
STOP
+9V
0V
V
V-REF : -5V
V-REF : -0.1V
V-REF : +9V

Fig. 1-7-9

The V. contour signal is used in this circuit. The high-frequency noise in the V. AS DET. signal (0H–2H) generated on the CC board is reduced by the LPF (C30, C31, L1, L2) and the output is applied to dual comparator IC18.

The threshold of the comparator are +100 mV and –200 mV. Levels above these limits become the output gate pulse.

The dual comparator of IC18 is provided with a strobe terminal. The comparator functions only when this terminal is "H".

The operation signal of this comparator is the area gate signal (extracted from the center of image), so that error detection is performed for the image center where the registration is most accurate.

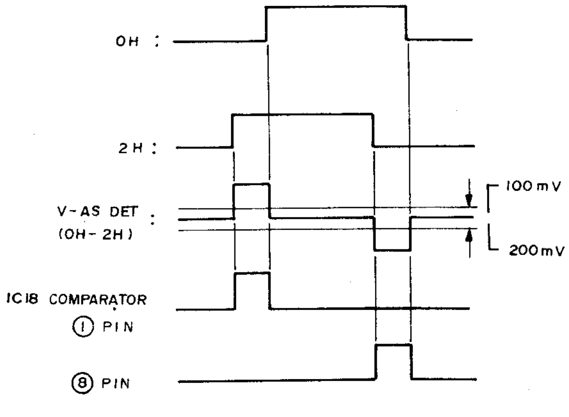

OH :
2H :
V-AS DET (OH-2H) :
100 mV
200 mV
IC18 COMPARATOR
① PIN
⑧ PIN

Fig. 1-7-10 Vertical error gate signal

3. Image mismatching detection

   The description here considers the video signal obtained from a black & white subject with clear contours and contrast.

   When there is a time error between the B and G contour signals (registration error), the difference between the two signals is output from IC5 on the AT-1 board.

4. Error detection

   The case when the timing of the B channel is in front of that of the G channel is described here.

1) Horizontal error detection

   The error signal (G-B ERROR) from pin ② of IC5 passes through the gate circuits in IC7.

   Fig. 1-7-12 shows the error signal passing through the gates.

   The output sections from the gates are integration circuits so the actual outputs are DC as shown by broken lines. They are variation from the reference voltages α or β (5 V). The gate output voltage are output from comparator IC-B as:

   $-(-\alpha) + \beta + \mathrm{Eref} = \alpha + \beta + 5\ \mathrm{V}.$

   On the other hand, when the timing of the B ch is behind that of the G ch, the polarity of the G-B ERROR is inverted. In consequence, the output from comparator IC7-B is:

   $-(+\alpha) + (-\beta) + \mathrm{Eref} = -(\alpha + \beta) + 5\ \mathrm{V}.$

   Thus the output voltage from IC7-B can indicate if the B ch image timing error is before or after the G ch image. When the G and B channels match, the G-B ERROR signal is not output. (Even if it is output, it is within the limits of detection of controller.)

The reference value (B-H SHIFT) of the next IC7-A (error reading comparator) is adjusted to meet the above condition. This voltage is almost the same as Eref (reference 5 V).

When there is an image error, the output voltage of IC7-B varies up or down with respect to Eref: this is detected by IC7-A and the centering (auto-shift registration) circuit is controlled so as to minimize the G-B ERROR signal.

The output signal (H or L) is used to control the count-up or countdown of the 8-bit up/down counter in IC24 on the AT-2 board.

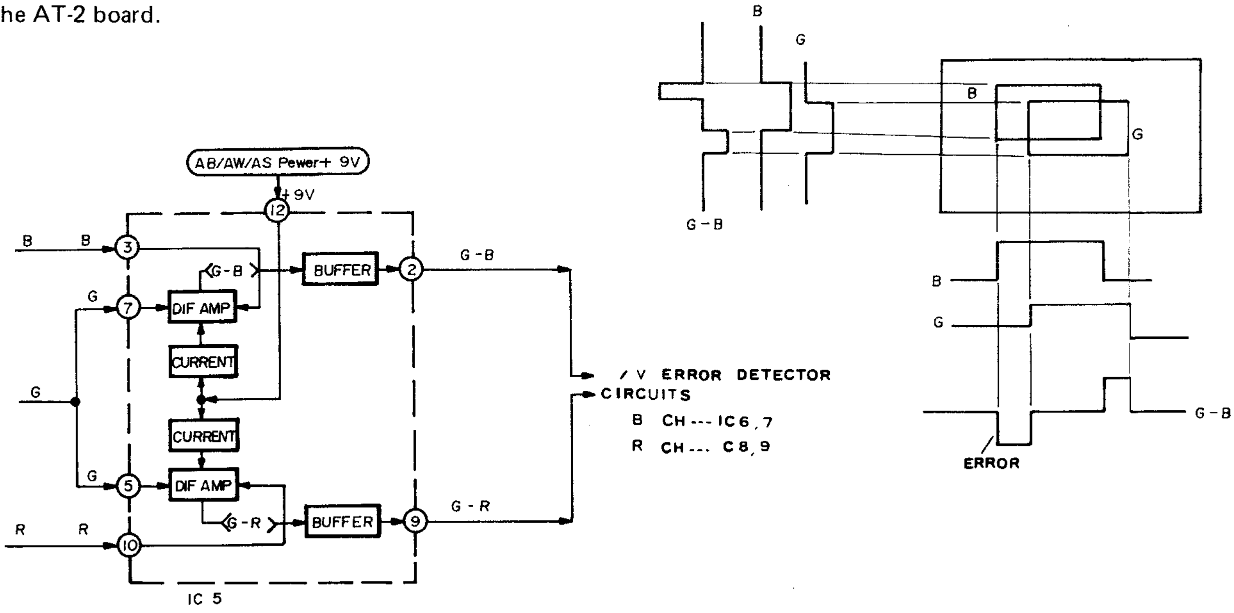

AB/AW/AS Power+ 9V
+9V
12
B
B
3
G-B
BUFFER
2
G-B
G
7
DIF AMP
CURRENT
G
CURRENT
G
5
DIF AMP
G-R
BUFFER
9
G-R
R
R
10
IC 5
/V ERROR DETECTOR CIRCUITS
B CH --- IC6, 7
R CH --- C8, 9
B
G
G-B
B
G
B
G
G-B
ERROR

Fig. 1-7-11

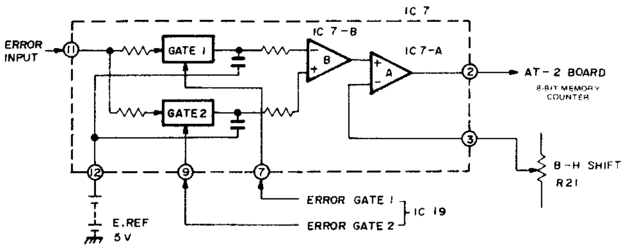

IC 7
IC 7-B
IC 7-A
ERROR INPUT
11
GATE 1
GATE 2
B
A
2
AT-2 BOARD
8-BIT MEMORY COUNTER
3
B-H SHIFT
R21
12
9
7
ERROR GATE 1
ERROR GATE 2
IC 19
E.REF
5V

Fig. 1-7-12

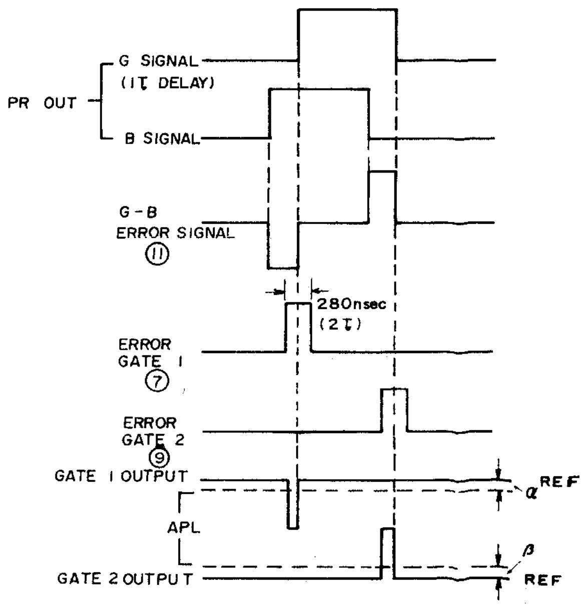

G SIGNAL
(1τ DELAY)
PR OUT
B SIGNAL
G-B
ERROR SIGNAL
11
280nsec
(2τ)
ERROR
GATE 1
7
ERROR
GATE 2
9
GATE 1 OUTPUT
APL
GATE 2 OUTPUT
α
REF
β
REF

Fig. 1-7-13

2) Vertical error detection circuit

The error signal (G-B ERROR) from pin ⑨ of IC5 passes through the gate circuits in IC6.

Fig. 1-7-16 shows the error signal passing through the gates.

The circuit's operation is the same as that of the horizontal error circuit.

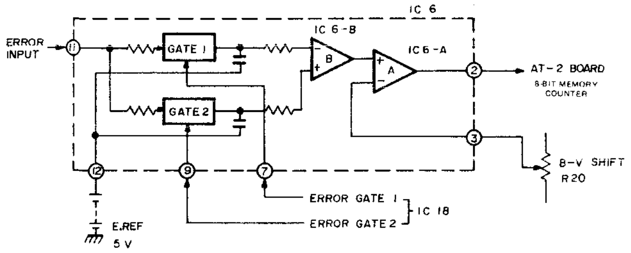

IC 6
IC 6-B
IC 6-A
ERROR INPUT
⑪
GATE 1
GATE 2
B
A
②
AT-2 BOARD
8-BIT MEMORY COUNTER
③
B-V SHIFT
R20
⑫
⑨
⑦
ERROR GATE 1
ERROR GATE 2
IC 18
E.REF
5 V

Fig. 1-7-14

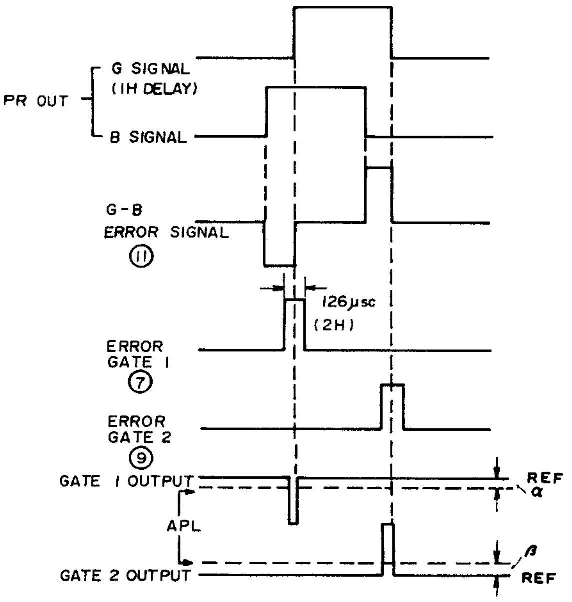

PR OUT
G SIGNAL (1H DELAY)
B SIGNAL
G-B ERROR SIGNAL
⑪
126μsc (2H)
ERROR GATE 1
⑦
ERROR GATE 2
⑨
GATE 1 OUTPUT
APL
GATE 2 OUTPUT
REF
α
β
REF

Fig. 1-7-15

5. 4-bit binary counter and 8-bit memory counter

The shift voltage in the condition in which centering is matched is memorized by the 8-bit D/A converter IC. When an error voltage (α or β) is generated by flipping the AUTO SHIFT switch, the counter in the D/A converter counts the clock pulses up or down so as to eliminate the error.

At the count which makes the error is zero, the state of comparator IC6-A is switched (from H to L or from L to H).

When the state of the comparator is switched, the count changes from up to down or from down to up. And the comparator repeats this state switching eight times centered around value zero.

IC29 counts the eight switchings of the comparator then closes the clock gate which has been opened.

The number of error count then is held by the memory counter.

The VD pulse is used to supply the clock pulse.

The digital number from the memory counter is converted into an analog voltage by the parallel D/A converter and supplied to the deflection circuit to shift the registration.

In the MANUAL (preset) mode, analog switch IC20 in the output stage (AT-1 board) separates the DC buffer amp output from the deflection circuit.

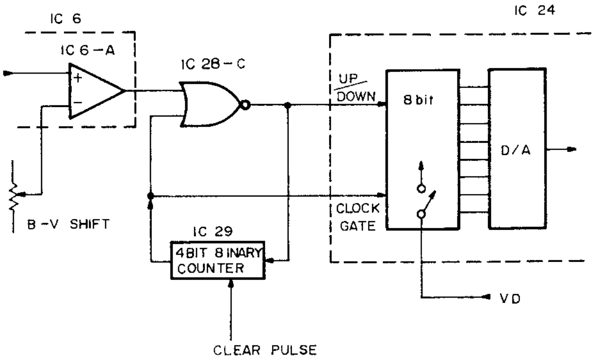

IC 6
IC 6-A
IC 28-C
IC 24
UP
DOWN
8 bit
D/A
CLOCK GATE
B-V SHIFT
IC 29
4BIT BINARY COUNTER
VD
CLEAR PULSE

Fig. 1-7-16

6. Area gate output (AT-2 board)

When the auto-shift adjustment is completed, the area gate signal, which is displayed in the viewfinder to indicate the AS operation, is eliminated using this circuit.

The output of the AND circuit composed of D15, D16 and D17 controls Q21.

IC29 and IC30 are 4-bit counters as described. When they finished counting 8 times, the outputs from pins ⑥ and ⑭ go from "L" to "H".

When all states are "H", Q21 turns ON and the output (7, IND SIG) changes from "H" to "L". Then IC4-B (analog switch) on the AT-1 board cuts the area gate signal.

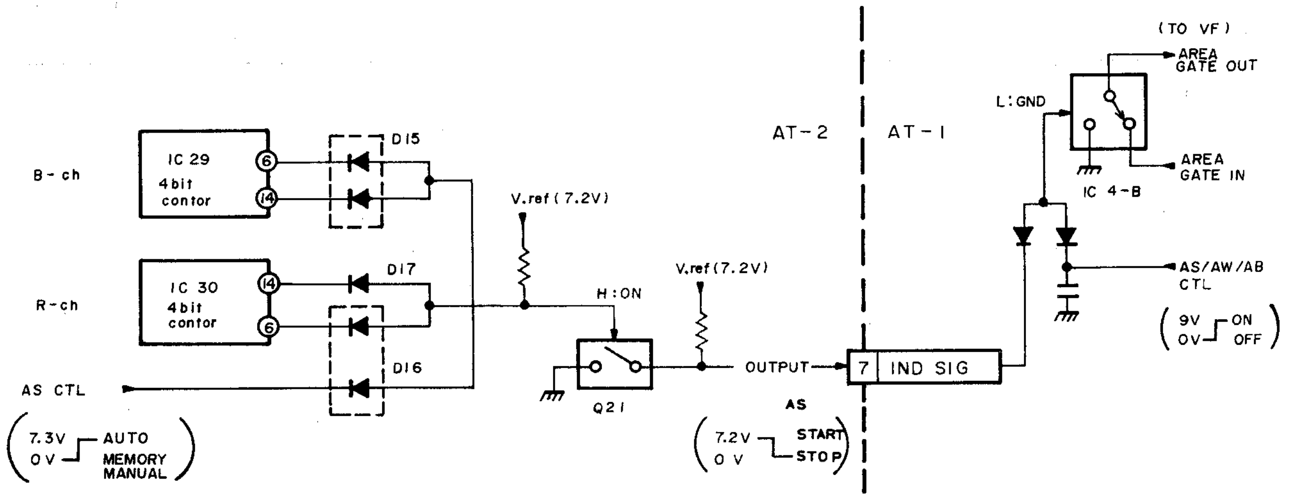

(TO VF)
AREA GATE OUT
L:GND
AREA GATE IN
IC 4-B
AT-2
AT-1
B-ch
IC 29
4bit contor
6
14
D15
V.ref (7.2V)
R-ch
IC 30
4bit contor
14
6
D17
H:ON
V.ref(7.2V)
D16
AS CTL
Q21
OUTPUT
7
IND SIG
AS
AS/AW/AB CTL
9V ON
0V OFF
7.3V AUTO
0V MEMORY MANUAL
7.2V START
0V STOP

Fig. 1-7-17

1.7.5 Auto black/Auto white

The signal levels of the R and B channel are compared with the reference G ch level.

The white balance is adjusted by shooting a white object, because it should offer the same level of R/G/B video outputs. The black balance is adjusted by shooting with the lens capped, because it should offer the same black level in the R/G/B channels.

The block diagram for the B channel is shown on the next page. Descriptions with also be given using the B channel as an example.

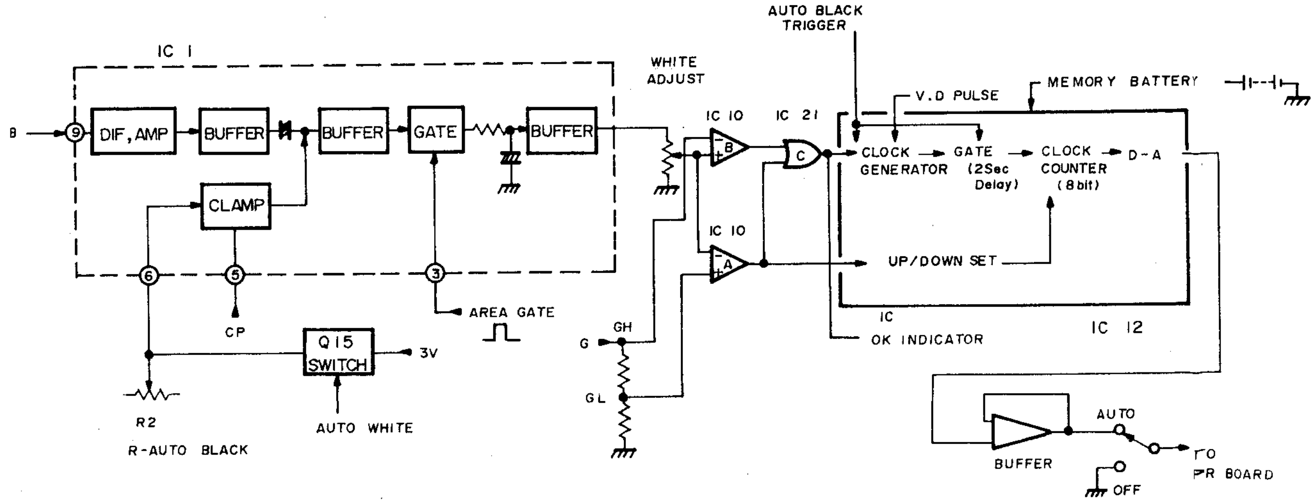

AUTO BLACK TRIGGER
IC 1
WHITE ADJUST
MEMORY BATTERY
V.D PULSE
B
9
DIF, AMP
BUFFER
BUFFER
GATE
BUFFER
IC 10
IC 21
B
C
CLOCK GENERATOR
GATE (2Sec Delay)
CLOCK COUNTER (8bit)
D-A
CLAMP
IC 10
A
UP/DOWN SET
6
5
3
AREA GATE
IC OK INDICATOR
IC 12
CP
Q15 SWITCH
3V
GH
G
GL
R2
R-AUTO BLACK
AUTO WHITE
AUTO
BUFFER
OFF
TO PR BOARD

Fig. 1-7-18

1. Auto black balance
When the AUTO BLACK switch is set to "AUTO", the black slice level of the white clip/black slice (IC304) of the video processing circuit (PR board) is pulled down so that the comparison of the pedestal level (black level) is possible. (See item 1.3.6.)
The lens iris is forcibly closed at this time (MT-2 board).
In Fig. 1-7-20, R2 (R. AUTO BLACK) determines the clamping potential of the clamping circuit in IC1. By comparison with the G channel's fixed clamping potential (3 V DC), the difference of black levels is obtained.
When there is a difference, IC10-A detects if the level is above or below the level between G_H and G_L.
The clock counter in IC12 is set to count down when the level is higher than G_H, and to count up when it is lower than G_L.

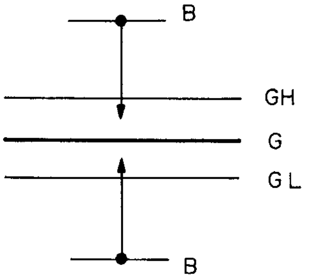


Fig. 1-7-19

The counter does not stop as long as there is a difference between B - G_L.
When the B ch black level is between G_H and G_L, the clock generator is stopped by the L signal from IC10-A which means that "the B is below G_H" and by the L signal from IC10-B which means that "the B is above G_L".
The B level should be between G_H and G_L.
When IC21-C goes "L" (with the B level between G_H and G_L) and, by the same adjustment operation for the R channel black level, when IC21-A goes "L" (with the R level between G_H and G_L), a signal is output to indicate that the auto black balance is OK.
The counter pulse number is D/A converted to become a DC potential for the adjustment of clamping potential in the video processing circuit. In the preset mode (when the AUTO BLACK switch is off), the potential is set at 3 V DC.
All the adjustments of the camera's video circuitry should be performed in this preset condition.
The clock counter (register) is an 8-bit circuit. It is backed up by a memory battery even when the camera power is off so that the adjustment value is held.

2. Auto white balance circuit
When the AUTO WHITE switch is operated, Q10 goes on and the clamping potential of IC1 becomes 3 V DC, which is the same as the G channel, so that the comparison of white levels is possible.
When a white or gray object is shot so that it fills the screen, the R/G/B levels of the video processing output should be the same: the levels of the IC1 outputs are compared by comparator IC10-B.
The operations after that are almost the same as the auto black circuit. The only differences are:
   1) In IC12, the clock gate, counter and D/A converter are provided separately from the auto black circuit. This means that the auto white balance data is stored in a different register from the auto black data.
   2) The lens iris close circuit does not function.
   3) By setting the AUTO WHITE/PRESET switch on the camera body, the auto white output can be separated (for preset value) at IC3-A and B (analog sw.) on the MT-1 board.

1.8 PS BOARD

1.8.1 Pickup tube electrode voltage generator circuit

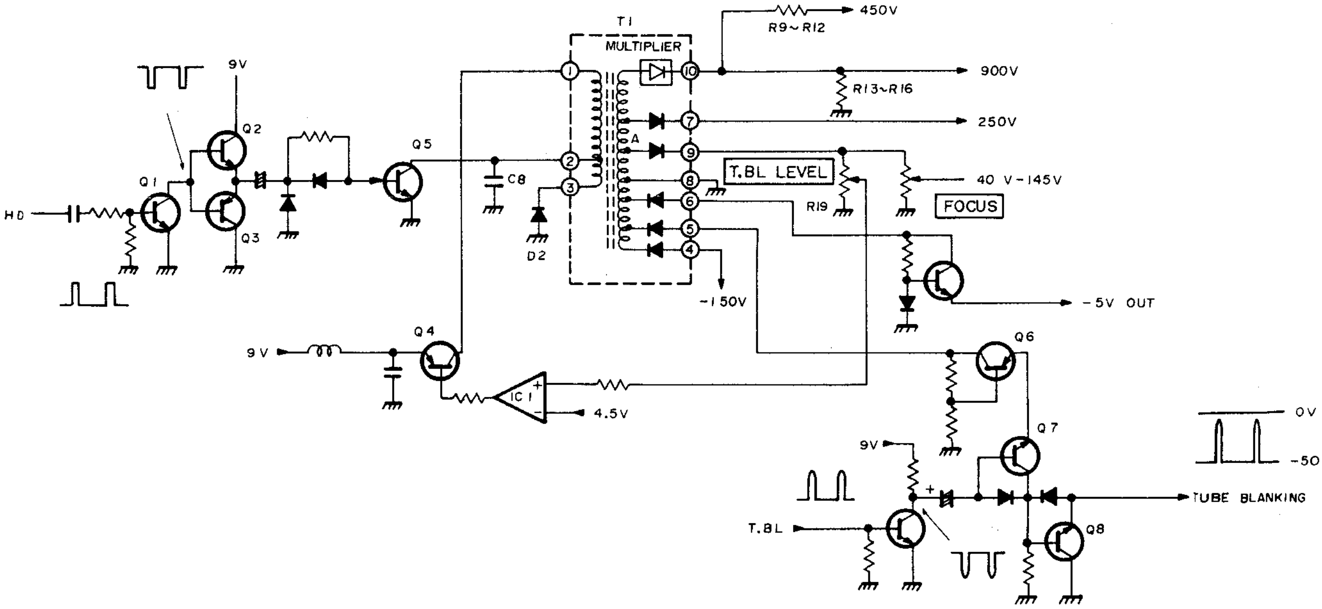

T1
MULTIPLIER
450V
R9~R12
900V
R13~R16
250V
9V
Q2
Q5
Q1
C8
A
T.BL LEVEL
40 V-145V
FOCUS
R19
HD
Q3
D2
-150V
-5V OUT
Q6
Q4
9V
IC1
4.5V
0V
-50V
Q7
9V
TUBE BLANKING
T.BL
Q8

Fig. 1-8-1 Voltage generator circuit

Flyback transformer T1 generates the pickup tube power to the electrodes of the Saticon tubes.
The power is stabilized by feeding back the focusing voltage to an error amplifier.

IC1 is the error amplifier which drives transistor Q4. Switching transistor Q5 is supplied with the voltage adjusted by T. BL LEVEL potentiometer R11.
Q7 and Q8 form the tube blanking pulse output circuit, which switches the voltage filtered by Q6 so that the electron beams are cut off during the blanking period of scanning line.
Since the relationship between the power supplies of the pickup tube electrodes should be predetermined, the T. BL LEVEL potentiometer is used to maintain this relationship by adjusting the amplitude of tube blanking pulse at –50 V to 0 V. This supplies the pickup tube's cathode with a bias voltage of –50 V.

1.8.2 Automatic beam control circuit

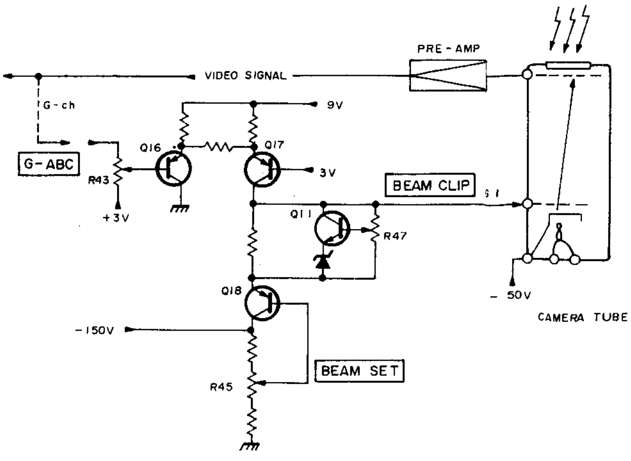
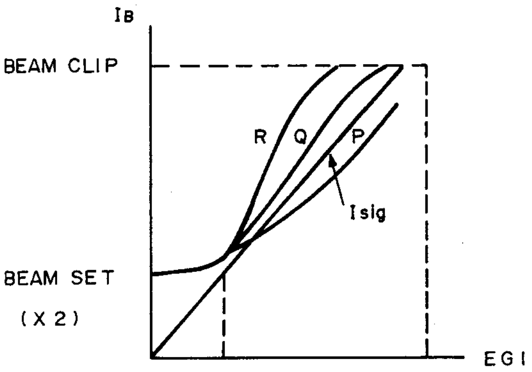

PRE-AMP
VIDEO SIGNAL
G-ch
9V
G-ABC
Q16
Q17
R43
3V
BEAM CLIP
+3V
Q11
R47
Q18
-50V
CAMERA TUBE
-150V
BEAM SET
R45

Fig. 1-8-2

When an object emitting strong light moves, comet tails are observed due to an insufficiency of the electron beams. This phenomenon is reduced by controlling the amount of the electron beam (cathode current) in proportion to the illumination of the object.
The amount of electron beam variation is controlled by varying the voltage of grid (G1) of the pickup tube. The potential of G1 is negative with respect to the cathode so that the grid operates to block the electrons emitted from the cathode.

The "comet tail" phenomenon is observed when the amount of electron beam is insufficient compared to the high level of light incident on the tube's target surface.
The automatic beam control (ABC) circuit controls the G1 potential by the amplitude of the preamp's video signal (which varies according to the amount of incident light). For the G channel, transistor Q18 sets the lower limit of the potential of G1 (i.e. the minimum beam current) using BEAM SET R45. Transistor Q11 sets the upper limit of the potential of G1 (the maximum beam current) using BEAM CLIP R47.
The video signal current is generated at the target electrode by the light striking the target, and is amplified by the preamp. With the video signal, transistor Q16 controls transistor Q17 which drives G1 between the upper and lower potential limits.
The response speed of the grid potential (i.e. beam current) which varies according to the video signal level is adjusted by G. ABC potentiometer R43. When the speed is high, the maximum beam current is easily reached by too little incident light. When the speed is low, the electron beam becomes insufficient with respect to over-level incident light.



EG I : G I BIAS
IB : BEAM CURRENT
Isig : SIGNAL CURRENT

Fig. 1-8-3

The beam current increases when the high-luminance incident light spot becomes twice the standard amount of light (set by BEAM SET). It reaches the upper limit via one of the above tracks R, Q and P.

- P: The beam current is insufficient compared to the signal current and comet tails are observed.
- R. Although there are few comet tails because the beam current is sufficient with respect to the signal current, the speed with which it increases is high so that oscillations, etc. occur.
- Q: Beam current that matches the signal current increases until reaching the upper limit.

The tracking characteristics of beam current with respect to the signal current, P, Q and R, should be adjusted with potentiometer ABC to obtain characteristic Q.
Even when the ABC circuit is operating, comet tails may be produced with a luminance above the limited range. Decay lag, which is almost burn, may also be observed with high-luminance spots.

1.9 CT BOARD

This circuit board includes the circuit for the selecting of the video signal to be supplied to the viewfinder and TEST OUTPUT connectors.

The signals used in connection with the video recorder are also controlled on this board.

1.9.1 Function display

At the video output amplifier for viewfinder signals, the area gate signal for video level display (zebra mark) and auto white/black/shift adjustment indication are superimposed.

For the zebra mark, a sine wave with a frequency of a 1/4 of the SC is superimposed onto the 90%–100% amplitude section of the video signal.

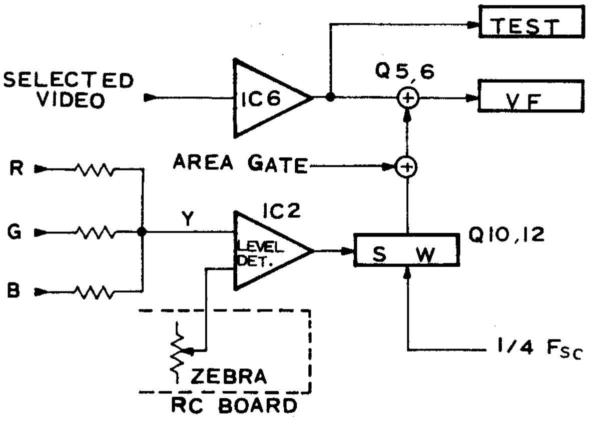


Fig. 9-1 Video indicator

When the amplitude of the artificial Y signal formed from the R/G/B signals using the matrix resistance is in the 90% to 100% range (adjustable with the ZEBRA VR), IC2's output is "H" allowing 1/4 fsc to pass through IC10.

1/4 fsc is supplied from the SE board. The supply/stop operation is controlled by the LEVEL IND switch on the front of the camera.

The area gate is displayed in a square area at the center of the viewfinder screen. This area is where the errors are detected for the auto-shft and auto white/black adjustments.

The area gate signal is used for the display indicating the operation of these automatic adjustments.

1.9.2 Microphone amplifier circuit

This circuit amplifies the sound from the microphone installed on the camera.

IC8 is the amp and the gain is determined by R50 at 40 to 50 dB. When a microphone with a standard audio output of –65 to –70 dB is used, an audio signal at about –20 dB is sent to the recorder via the VTR cable.

The gain increases when the impedance of R50 is increased.

S3 allows the audio output level to be set to "HIGH" (–20 dB) or "LOW" (through output) according to the video recorder connected.

When the switch is set to "LOW", the microphone circuit is 3-line balanced so it is necessary to use a 14-pin VTR cable.

For special microphones which require an external power supply such as electret mikes or mikes with built-in amps, R48 and C21 can supply 9 V DC power via the 5-pin MIC connector.

1.9.3 Registration image selector circuit

By superimposing the positive R or B signal and negative G signal together on the monitor screen, registration errors can be discovered easily.

The negative G signal for registration adjustment is generated on the CT board.

IC6 is the G signal inverter circuit.

As the DC component of the blanking section (pedestal black) may be lost by simple invertion, a CBL pulse is mixed so that the blanking level with positive polarity also becomes the blanking level in the inverted condition.

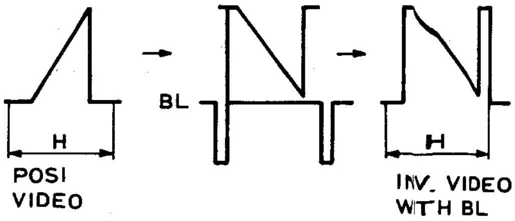


Fig. 1-9-2 G channel inverter

1.9.4 Video recorder power-save circuit

With 14-pin type recorders such as the JVC CR-4700/4900, the power-save standby mode of the recorder can be controlled via the audio signal line.

Operate SW position	Camera mode	14-pin Recorder (CR-4700/4900)
ON/ST BY	ON	STANDBY
ON/SAVE	ON	SAVE
OFF/SAVE	OFF	SAVE

Fig. 1-9-3

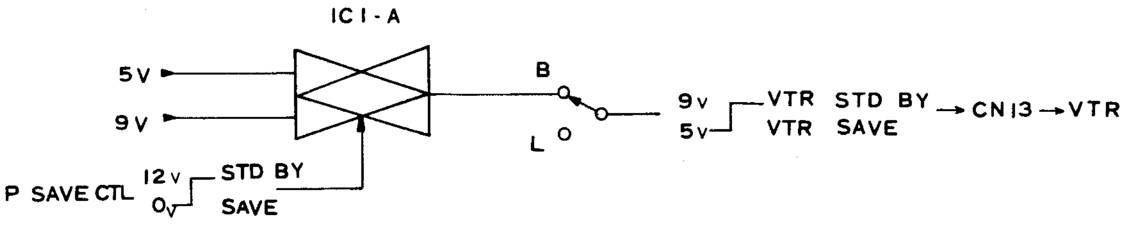

IC1-A
5V
9V
B
L O
12V STD BY
P SAVE CTL
0V SAVE
9V VTR STD BY
5V VTR SAVE
→ CN13 → VTR

Fig. 1-9-4

As recorder standby is activated by 9 V and save is activated by 5 V, switching is performed by IC1-A.

1.10 RC BOARD

1.10.1 Video signal output circuit

When the RS-500 remote control unit is used, the video signal is output to the camera adapter from this circuit.

By switching on the power of the RS-500 main unit, power is supplied to the camera's output circuit and IC3 in the video output stage is activated.

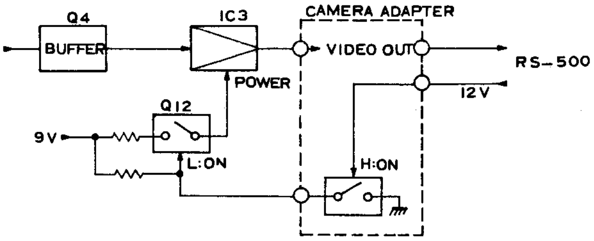

Q4
BUFFER
IC3
CAMERA ADAPTER
VIDEO OUT
RS-500
POWER
12V
Q12
9V
L:ON
H:ON

Fig. 1-10-1

1.10.2 R/G/B output circuit

When the remote control unit is connected, this circuit outputs separate R/G/B signals.

Q11 is turned on by the +9 V power supplied from the RS-500. Q8 and Q7 are also used for temperature compensation of the G channel.

This circuit has a high-impedance output and the video signal carrier is 3 V DC. It is not possible to terminate the output with a 75 ohm plug.

As the power of this circuit (9 V) is supplied from the RS-500 main unit, KY-210 itself cannot provide R, G and B output.

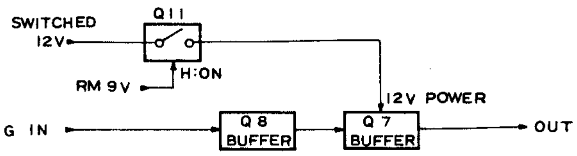

SWITCHED 12V
Q11
H:ON
RM 9V
12V POWER
G IN
Q8 BUFFER
Q7 BUFFER
OUT

Fig. 1-10-2

1.11 MT-1 BOARD

At the same time that the MT-1 board is used to plug in mother circuit boards, it also includes the following circuit.

1. Sync separator circuit: part of genlock circuit
2. Video signal output circuit
3. Control circuit when the remote control unit is used.
4. +3 V/5 V/+7 V regulator circuit

Descriptions will be given for circuits 1. and 2.

1.11.1 Sync separator circuit

This circuit generates the sync pulse and V reset pulse from the external genlock signal (VBS or BB).
The external genlock signal is sync-separated at IC5/IC6.
The EXT. SYNC signal is output from pin ⑪ of IC6 and input to pin ⑦ (CN5) of the SE board (for H locking).
The EXT. SYNC signal passes through a double-integration circuit and the V. RESET pulse is generated. The V. RESET pulse is input to pin ⑮ (CN5) of the SE board and reset (with the fall timing of pulse) with the SSG IC to match the V. pulse.

1.11.2 Video signal output circuit

When a JVC portable video recorder is used with the camera and the recorder is set to the playback mode, the camera's video signal line is used as the return signal line for the recorder's playback signal. Because of this, the camera's video output is interrupted during recorder playback.

During recording, the camera's video signal is supplied to the recorder via Q8 and Q11. The voltage at the base of Q11 is then approx. 2.8 V.
During recorder playback, a potential of approx. 4 V is superimposed on the recorder line, and approx. 4 V is also applied to the emitter of Q11.
This 4 V potential cuts off Q11 interrupts the camera's video signal; at this time the video recorder's playback signal is supplied to the viewfinder.
During recorder playback Q9 is turned ON and Q12 is also turned ON. With this, the zebra control line becomes +9 V and the zebra signal is cut off at the CT board.

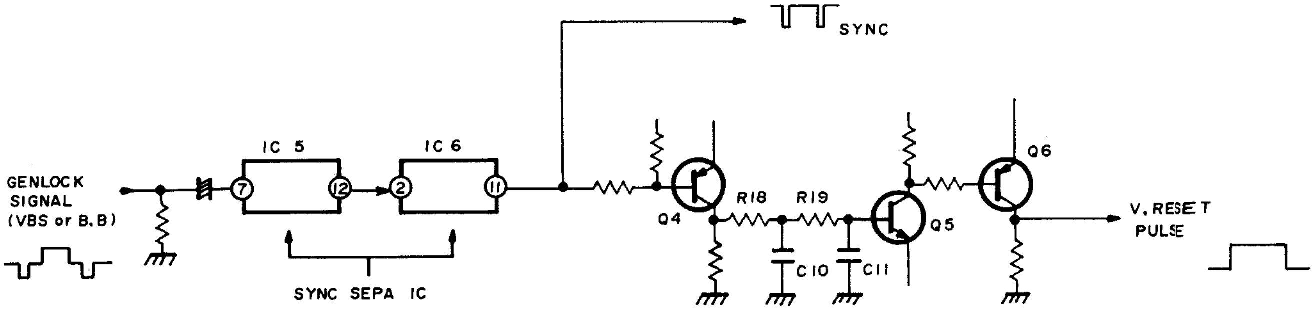


Fig. 1-11-1

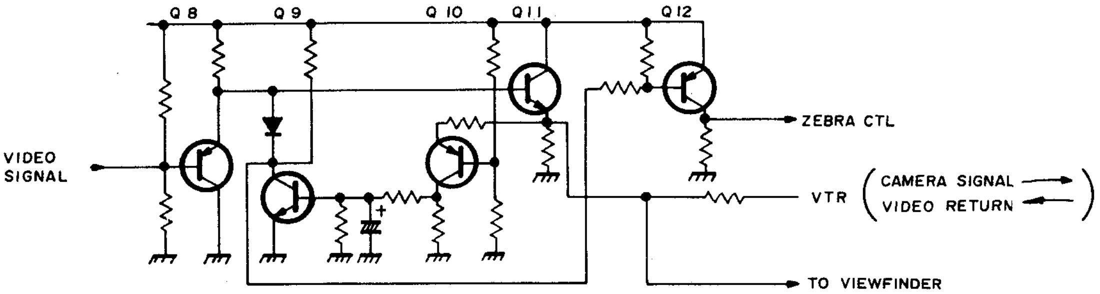


Fig. 1-11-2

1.12 MT-2 BOARD

1.12.1 Alignment correction circuit

This circuit board is placed below the G-ch section of the prism optical unit. The board includes a circuit which aligns the electron beam using the magnetic field generated by coils.

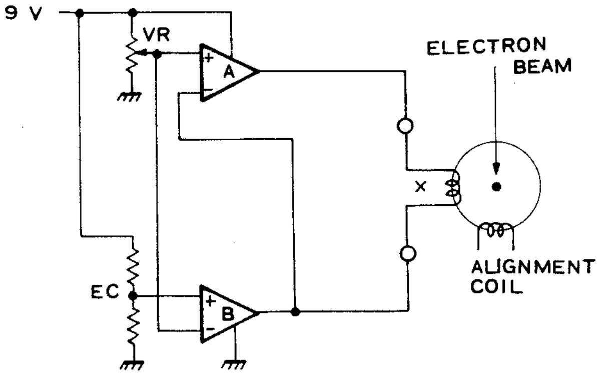


Fig. 1-12-1 IC internal circuit

The diagram above shows an equivalent circuit of the cirduit in the IC. The rightmost coils are perpendicular to the electron beam (X and Y axes).
With respect to the potential determined by the VR, IC-A is a positive-phase amp and IC-B is a negative-phase amp.
Centering around Ec (center point potential), a difference is generated between the output terminal voltages of IC-A and IC-B, and the direciton and amount of current flowing in alignment coil X (and therefore the polarity and intensity of the magnetic field) vary.
As the same circuit is provided for alignment coil Y, the shape of the electron beam can be adjusted (aligned) within the cross magnetic field.

1.12.2 Lens iris control circuit

The iris controlled by the NAM (R, G and B mixed) signal output from the PR board. To correctly opeate the automatic function and to protect the pickup tubes, the following controls are performed.

1. When the AB (auto black) switch is set to "AUTO" or when the BARS (color bar) switch is set to "ON":
   – The lens iris is closed.
2. When the AS (auto shift) switch is set to "AUTO" or when the AW (auto white) switch is set to "AUTO":
   – The lens iris is set to the auto mode.
3. When the OPERATE switch is set to "OFF":
   – The lens iris is closed.

With condition 1. above, the point Ⓐ level becomes GND (0 V) and the lens is closed.
So that the lens is closed even when the mode switch is set to "MANUAL", Q1 and Q2 supply 7.6 V to point Ⓑ and set the lens mode forcibly to automatic.

With condition 2., 8.4 V is supplied to point Ⓑ so the lens mode is forcibly set to automatic as described above.

With condition 3., the iris control signal at point Ⓐ disappears, point Ⓐ's voltage becomes 0 V and the lens is closed. (However, the lens is supplied with unswitched 12 V.)
Of course, when the lens mode is set to "MANUAL", Q1 and Q2 forcibly set the mode to automatic and close the lens iris.

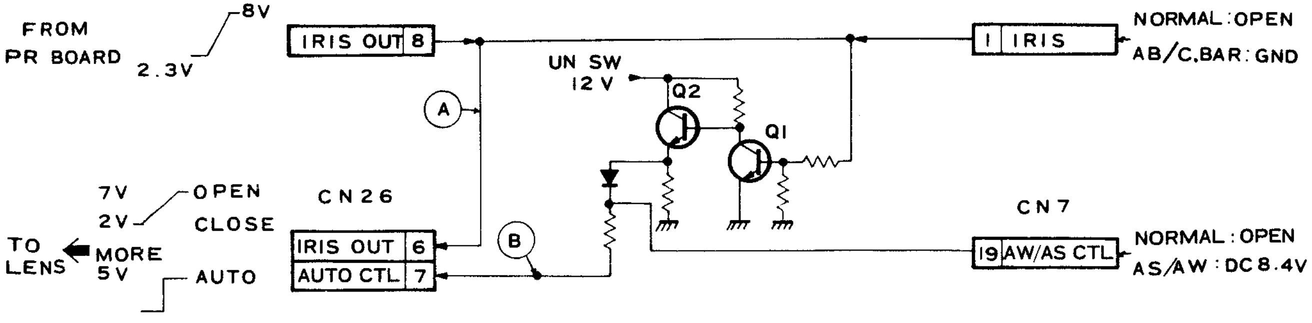


Fig. 1-12-2 Iris control circuit

SECTION 2
DISASSEMBLY

2.1 REPLACEMENT OF PRINCIPAL PARTS

2.1.1 Fuse replacement

Before replacing a fuse, the reason why it blew should be investigated to prevent trouble from spreading. The malfunction should be repaired before replacing the fuse.

1. Before replacing the fuse, set the Power switch ① OFF or disconnect the power cord.
2. Remove four screws ② fixing the battery guide base.

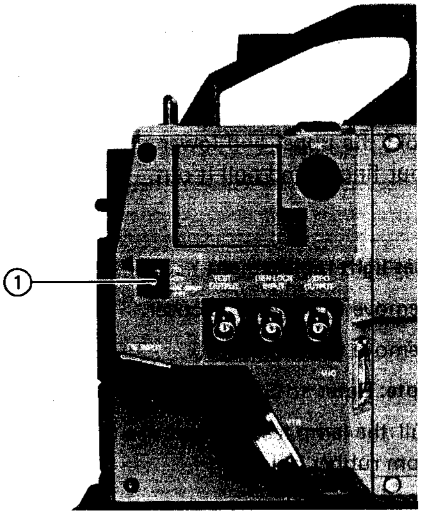


Fig. 2-1

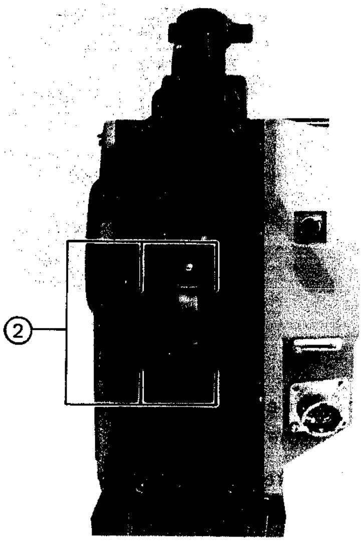


Fig. 2-2

3. Remove the battery guide base. And remove the fuse inside it with screwdriver, etc.
4. For the protection of the camera and for your safety, replace with a fuse the specified part number.

QMF51U1-3R15; 3.15 A

2.1.2 Replacement of memory battery

The memory battery (JVC : SCV0636 equivalent Lityum battery 3 V) runs two to three years as the circuit consumes a few micro amps. Replace the memory battery if the voltage drops below 2.5 V DC (with high impedance voltmeter as DTDM).

The battery is soldered in place.

- **Serial Nos. 0295xxxx and before follow the below procedure.**
- **The battery is soldered in AT board for Serial Nos. 0395xxxx and after.**

1. Remove two screws ① and the sholder pad ②.

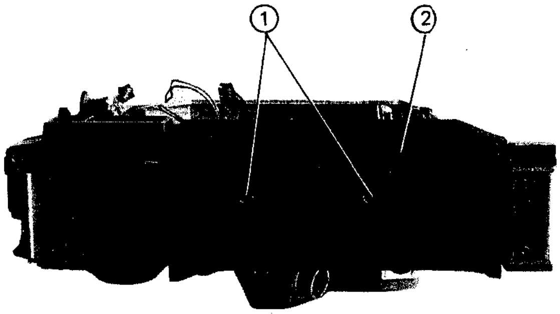


Fig. 2-3

2. Remove two screws ③ and to open the battery cover ④.

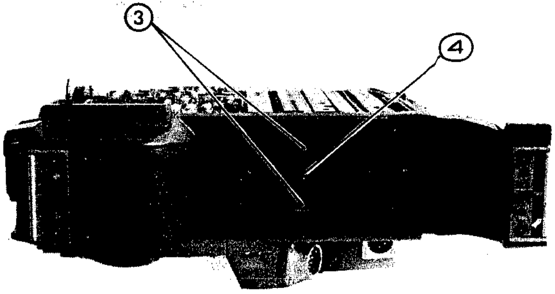


Fig. 2-4

3. When replacement of the battery, be careful of the polarity. The negative (—) polarity is the camera side.

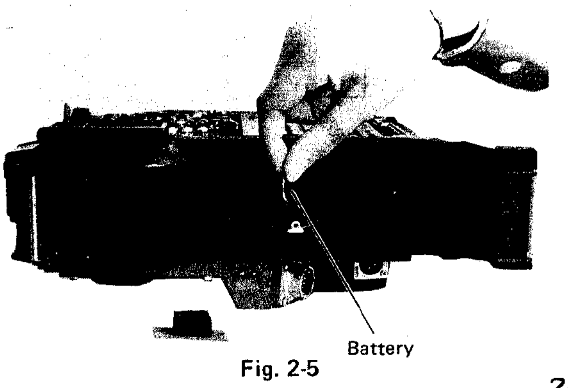


Fig. 2-5

2.1.3 Removing the side covers

1. Left side cover:
   Remove four screws ①.

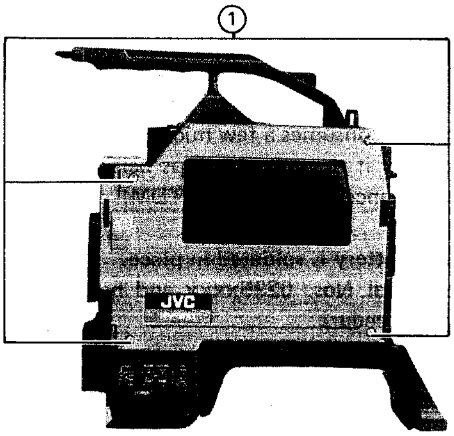


Fig. 2-6

2. Right side cover:
   Remove four screws ②.

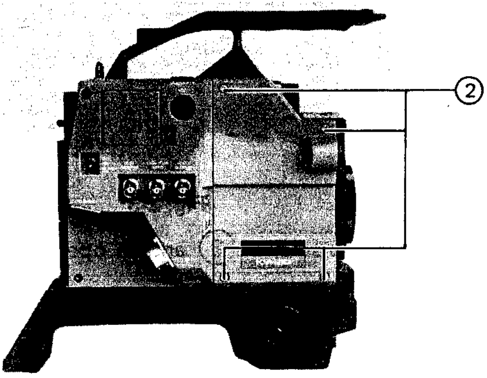


Fig. 2-7

3. Back cover (right):
   Remove two screws ③.

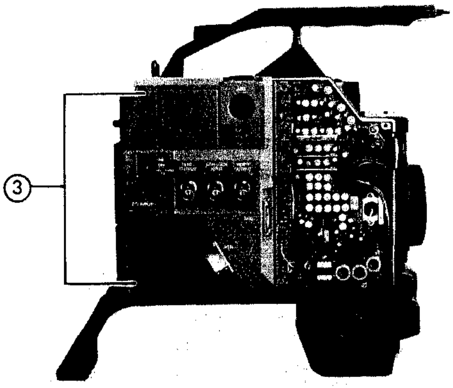


Fig. 2-8

2.1.4 Removing the optical filter disc

Close lens iris or cap the lens.

1. Turn two screws ① counterclockwise to loosen them.

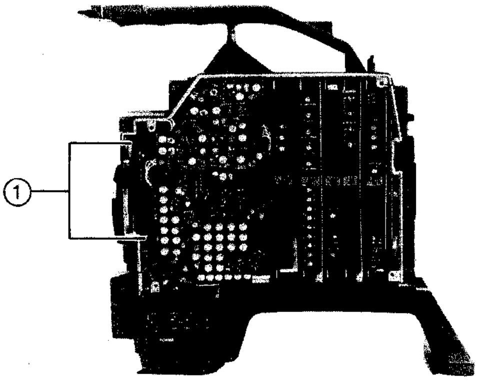


Fig. 2-9

2. Hold the upper and lower sides of the filter holder with your fingers and pull it out.

2.1.5 Bias light replacement

1. Remove the right-side cover.
2. Remove the DF board.

   Note: Refer to Section 2.2.3 of removing the DF board.
3. Pull the lamp lead wire outlet ① and take out the lamp from rubber holder.

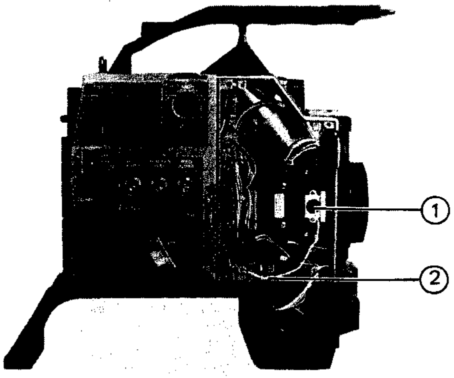


Fig. 2-10

4. Remove the end of the lamp lead wire ② from the connector on the MT-2 board.

   Note: After replacing the lamp, it is necessary to perform the static shading and black balance adjustments again.

2.2 REMOVAL OF PRINCIPAL CIRCUIT BOARDS

2.2.1 Removing the plug-in circuit boards

The circuit boards which are numbered from 1 to 5 on the panel are to be removed using the board remover tool provided with the camera.

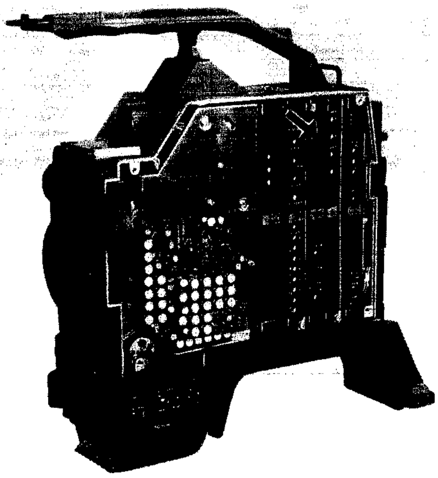


Fig. 2-11

1. Insert the pin of the extracter into the hole on the top of the circuit board and pull up the lever of the tool.
2. When the circuit board is disconnected, hold the top and bottom of the circuit board with your fingers and pull it out.

2.2.2 Removing the PA board

1. Remove two screws ① fixing the shield cover and remove the shield cover.

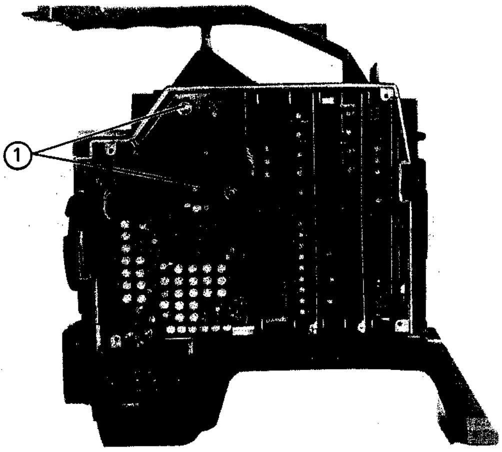


Fig. 2-12

2. Disconnect the PA board connector.
3. Remove two studs ② and screw ③ that hold the circuit board, and take out the PA board.

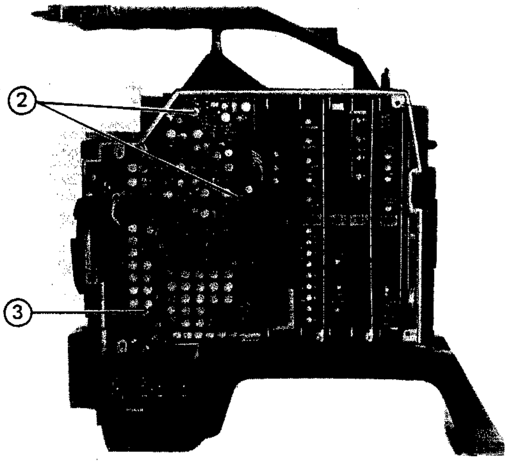


Fig. 2-13

2.2.3 Removing the DF board

1. Remove the three connectors ①–③ from the deflection yokes, and the connector ④ from the SE board.

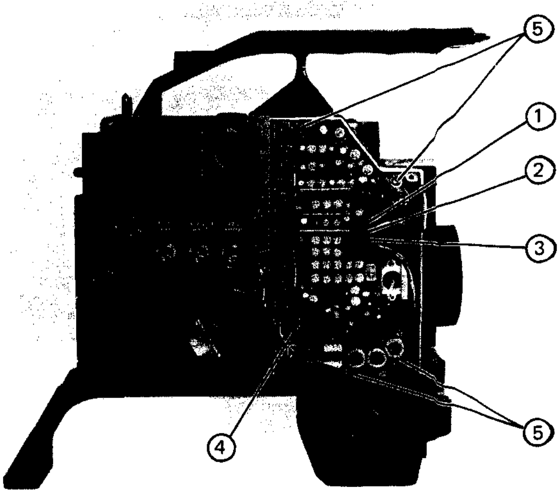


Fig. 2-14

2. Remove four screws ⑤ and remove the DF board.

2.2.4 Removing the CT board

1. Remove the right side cover and back cover. (Refer to Section 2.1.3.)
2. Remove three screws ① on the back cover, then, remove the CT board.

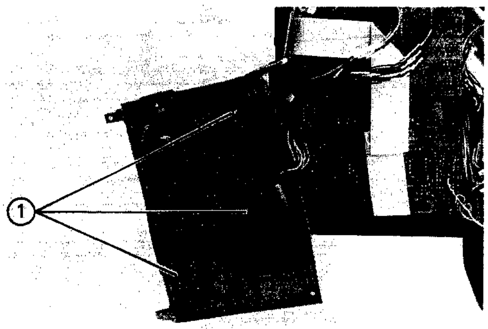


Fig. 2-15

2.2.5 Removing the MT-2 board

1. Remove the PA board. (Refer to Section 2.2.2.)
2. Remove two screws ① behind the PA board and remove the shield cover.

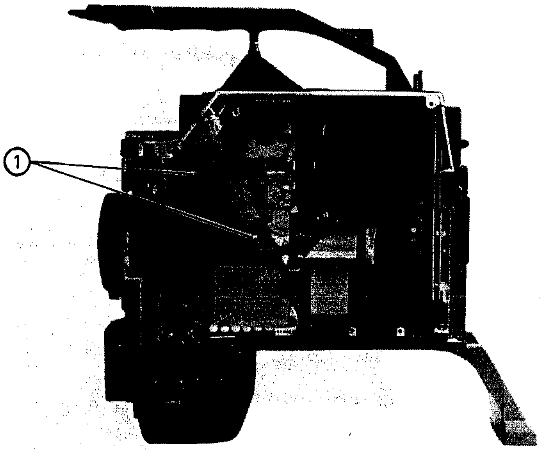


Fig. 2-16

3. Remove the DF board. (Refer to Section 2.2.3.)
4. Remove a screw ② (PA board side) and a screw ③ (DF board side).

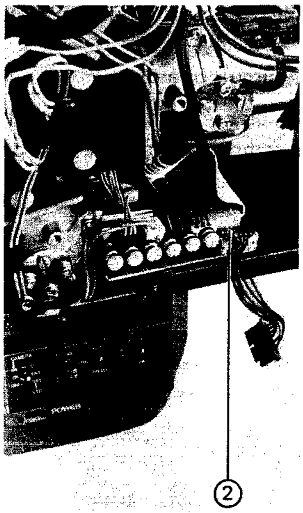


Fig. 2-17

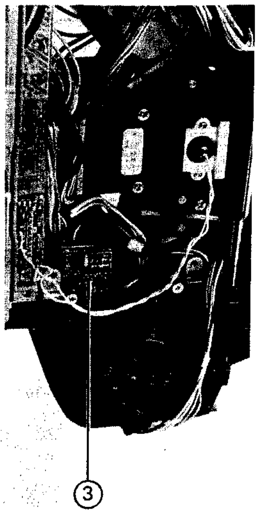


Fig. 2-18

5. The end of the MT-2 board is inserted into a slot in the camera. Pull the MT-2 board and disconnect its connector.

2.2.6 Removing the RC board

1. Remove two screws ① and the shoulder pad ②.

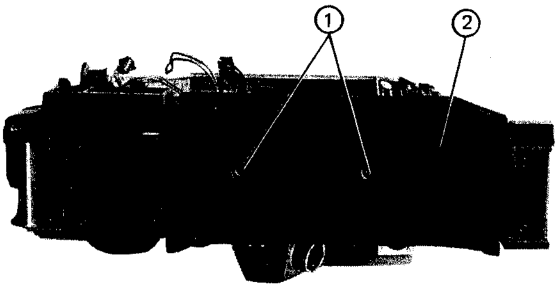


Fig. 2-19

2. Remove a screw ③ fixing the foot base.

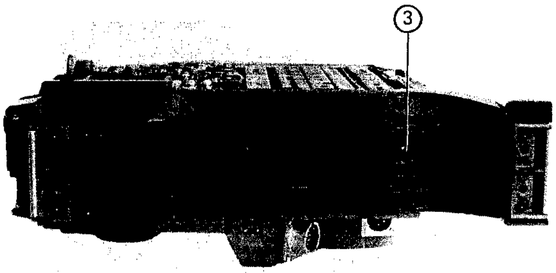


Fig. 2-20

3. Remove four screws ④ fixing the rear cover.
4. Remove the rear cover.

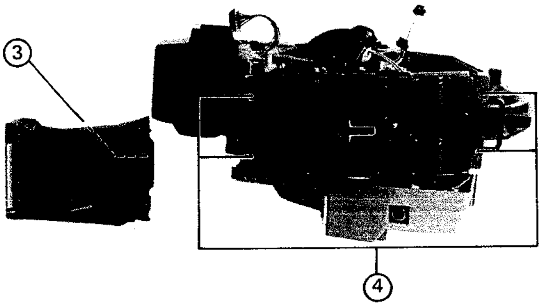


Fig. 2-21

5. Remove two screws ⑤ on the shield plate.

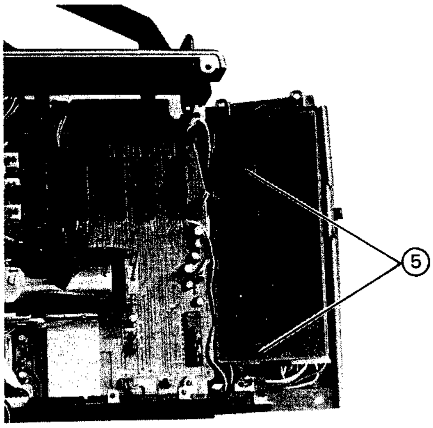


Fig. 2-22

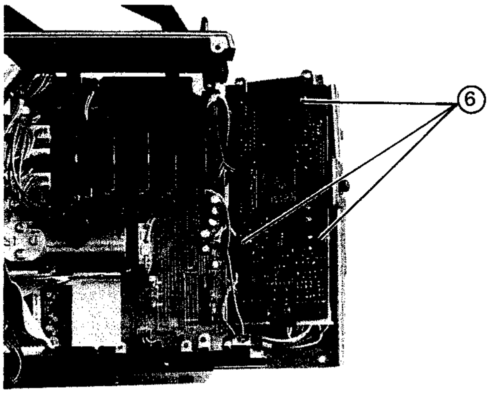


Fig. 2-23

6. Remove three screws ⑥ fixing the RC board.

2.2.7 Removing the SW panel

1. Remove two screws ① fixing the SW panel.

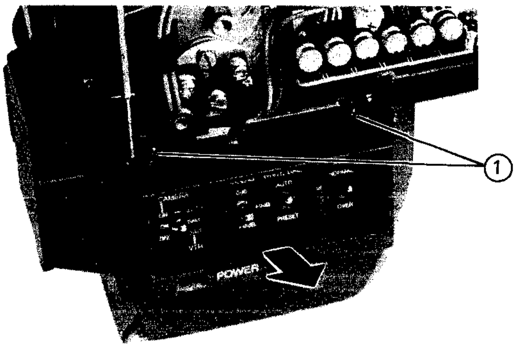


Fig. 2-24

2. The SW panel can be pulled out together with the switch and SW board.

SECTION 3
REPLACEMENT OF CAMERA TUBE

3.1 REPLACEMENT OF CAMERA TUBE

- The pickup tubes are not interchangeable with pickup tubes other than specified for each model.
- If a strong shock is applied to the pickup tube or it is dropped when replacing it, the photoelectric layer may be damaged.
- The replacement operation should be done in a clean room.
- When replacing, take care not to leave fingerprints or grease on the faceplate, target ring and body of the pickup tube. Use a mixture of 50% ethyl alcohol and 50% ethyl ether to remove dirt and grease.

3.1.1 Removing external parts

1. Remove the covers and circuit boards following the items below:
   - 2.1.3 Removing the side covers
   - 2.2.1 Removing the plug-in circuit boards
   - 2.2.2 Removing the PA board
   - 2.2.3 Removing the DF board
2. Remove two screws ① behind the PA board and remove the shield cover.

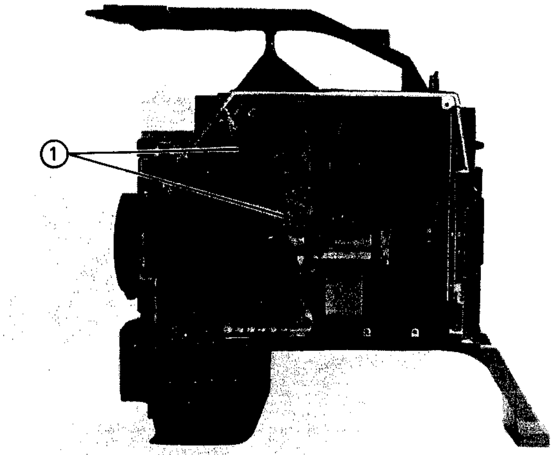


Fig. 3-1

3.1.2 Removing the deflection yoke

Note: This model does not require the deflection yoke to be removed when replacing the pickup tube. Proceed to Sec. 2.1.3 for pickup tube replacement.

1. Remove two screws ① fixing the base bracket.

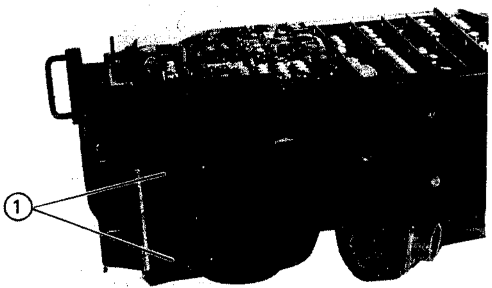


Fig. 3-2

2. Remove two screws ② fixing the MT-1 board.

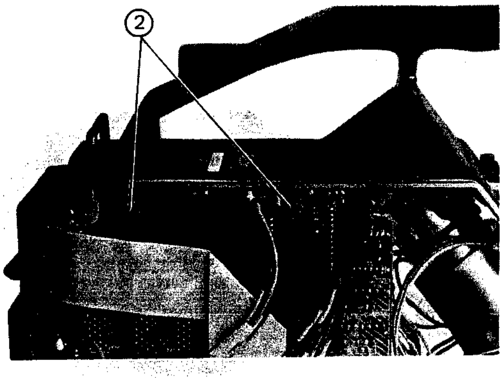


Fig. 3-3

3. Remove two screws ③ fixing the front frame.

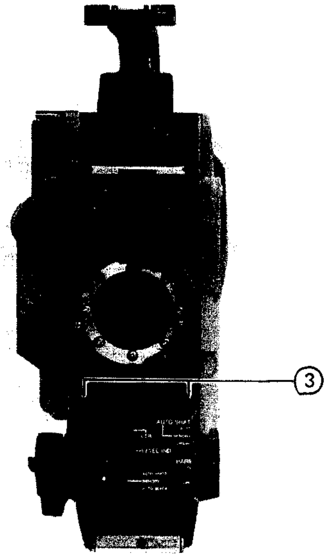


Fig. 3-4

4. Remove the SW board.
(Refer to Section 2.2.7.)

5. Remove two screws ④ fixing the rear frame.

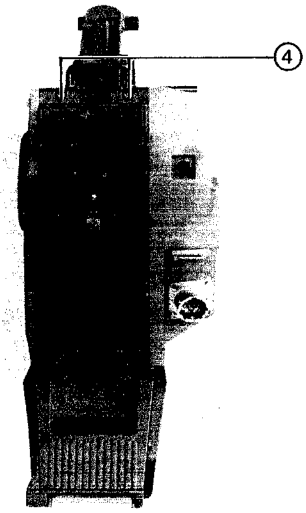


Fig. 3-5

6. Hold the front frame ⑤ and pull out the optical block to front side.

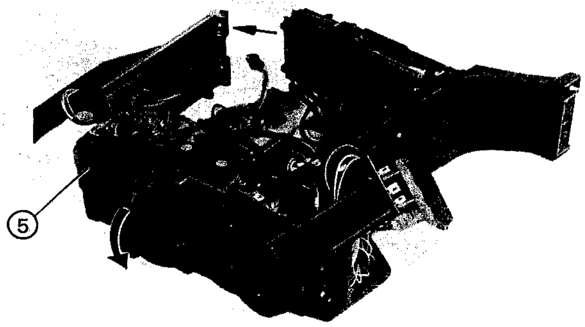


Fig. 3-6

[A] Removing the B channel deflection yoke

1. Remove two screws ① fixing the top frame and remove the top frame.

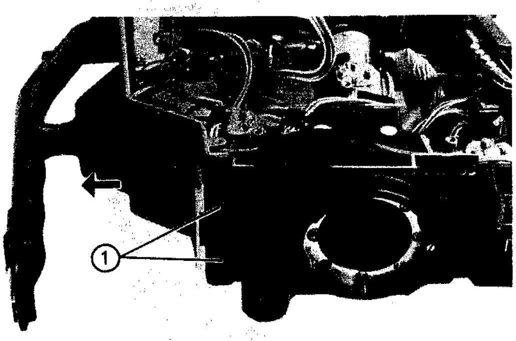


Fig. 3-7

2. Remove two screws ② fixing the back focus and rotation adjustment mechanisms and remove the parts composing these mechanisms. The lug terminal of the ground lead wire will also be removed in this operation.

3. Loosen the yoke lock screw ③ and take out the deflection yoke from the optical block.

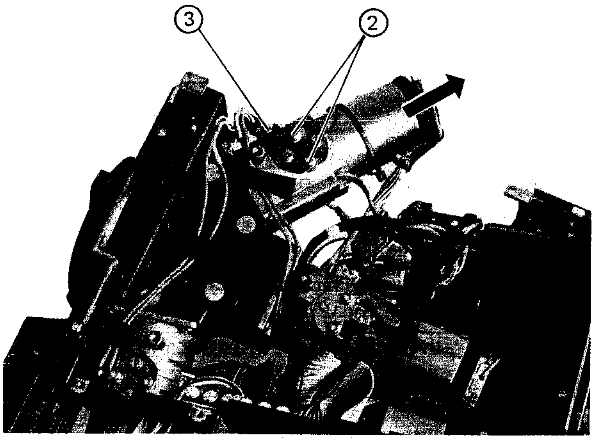


Fig. 3-8

[B] Removing the G channel deflection yoke

1. Remove the yoke shield (black).

2. Remove two screws ① and remove the back focus and rotation adjustment mechanisms.

3. Loosen the yoke lock screw ② and take out the deflection yoke from the optical block.

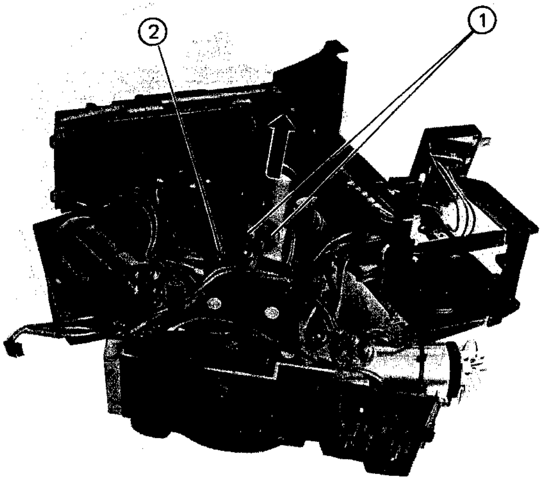


Fig. 3-9

[C] Removing the R channel deflection yoke

1. Remove two screws ① and remove the back focus and rotation adjustment mechanisms.
2. Loosen the yoke lock screw ② and take out the deflection yoke from the optical block.

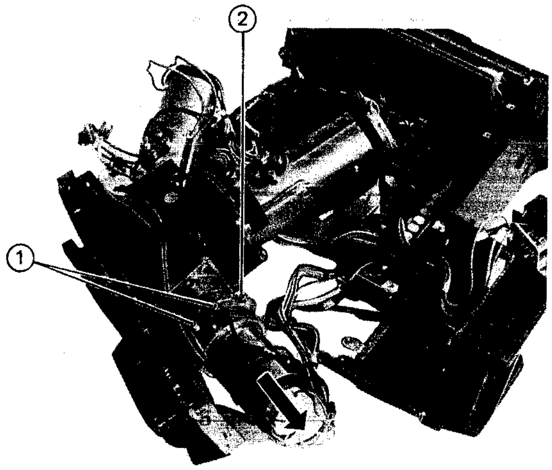


Fig. 3-10

3.1.3 Removing pickup tube

[A] B channel pickup tube

1. Remove five screws ① fixing the top handle and remove the handle.

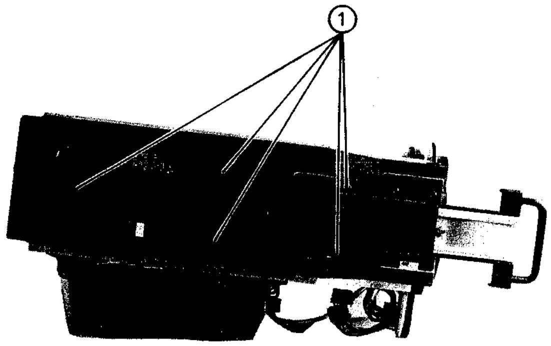


Fig. 3-11

2. Remove socket ② gently so that no unnecessary force is applied to the electrode pins of the pickup tube.

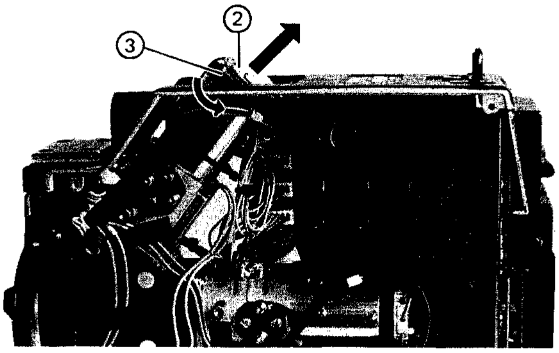


Fig. 3-12

3. Remove the pickup tube lock ring ③ by turning it counterclockwise.
4. Hold the pickup tube neck and pull it out backward.

[B] G channel pickup tube

1. Remove the rear cover.
(Refer to Section 2.6.6 [1] to [3].)
2. Remove the yoke shield (black) from G channel yoke.
3. Remove socket ① gently so that no unnecessary force is applied to the electrode pins of the pickup tube.

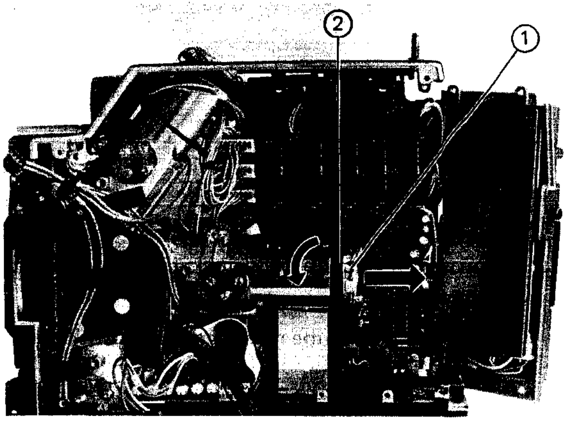


Fig. 3-13

4. Remove the pickup tube lock ring ② by turning it counterclockwise.
Hold the pickup tube neck and pull it out backward.

[C] R channel pickup tube

1. Remove two screws ① from the bottom of the camera and remove the bottom panel ②.

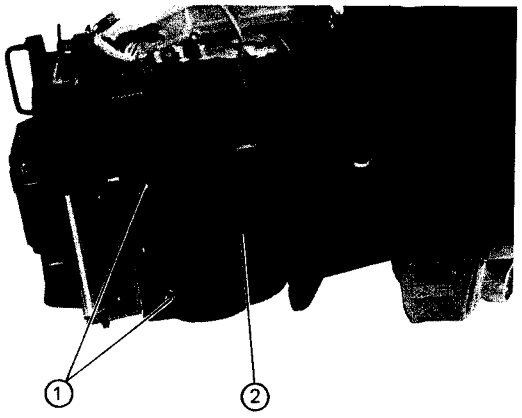


Fig. 3-14

2. Remove socket ③ gently so that no unnecessary force is applied to the electrode pins of the pickup tube.

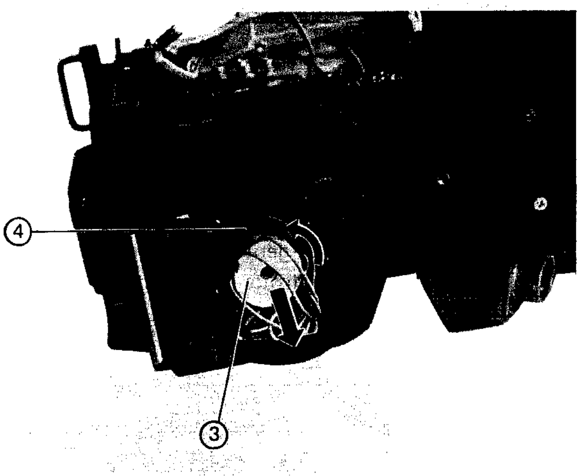


Fig. 3-15

3. Remove the pickup tube lock ring ④ by turning it counterclockwise.
4. Hold the pickup tube neck and pull it out backward.

3.2 INSERTING THE PICKUP TUBE

1. Clean the new pickup tube and check that there is no dirt on the faceplate. Also clean the target ring (metal part).
2. Insert the pickup tube so that the index space is perpendicular to the camera body (the axis of the deflection yoke), until the end position is fixed.

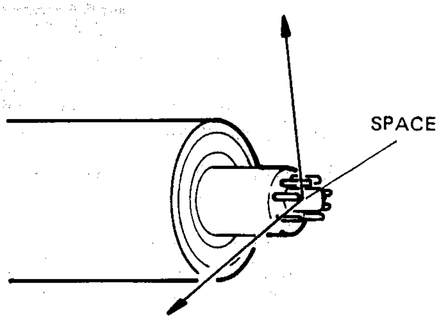
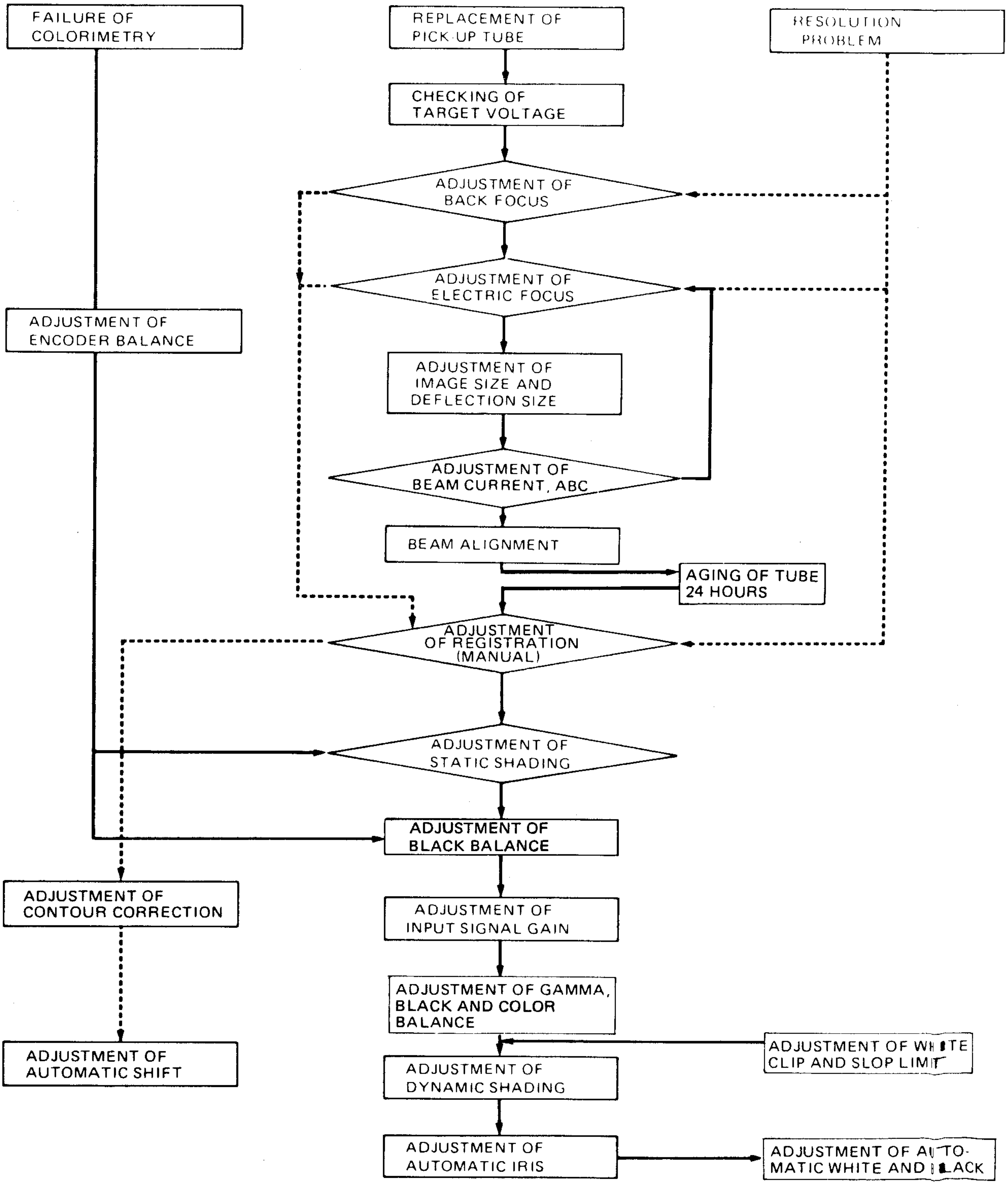


Fig. 3-16

3. Install the pickup tube lock ring and secure it.
4. Install the pickup tube socket and complete assembly.

SECTION 4
ADJUSTMENT PROCEDURE

4.1 ADJUSTMENT PROCEDURES


FAILURE OF COLORIMETRY
REPLACEMENT OF PICK-UP TUBE
RESOLUTION PROBLEM
CHECKING OF TARGET VOLTAGE
ADJUSTMENT OF BACK FOCUS
ADJUSTMENT OF ELECTRIC FOCUS
ADJUSTMENT OF ENCODER BALANCE
ADJUSTMENT OF IMAGE SIZE AND DEFLECTION SIZE
ADJUSTMENT OF BEAM CURRENT, ABC
BEAM ALIGNMENT
AGING OF TUBE 24 HOURS
ADJUSTMENT OF REGISTRATION (MANUAL)
ADJUSTMENT OF STATIC SHADING
ADJUSTMENT OF BLACK BALANCE
ADJUSTMENT OF CONTOUR CORRECTION
ADJUSTMENT OF INPUT SIGNAL GAIN
ADJUSTMENT OF GAMMA, BLACK AND COLOR BALANCE
ADJUSTMENT OF AUTOMATIC SHIFT
ADJUSTMENT OF WHITE CLIP AND SLOP LIMIT
ADJUSTMENT OF DYNAMIC SHADING
ADJUSTMENT OF AUTOMATIC IRIS
ADJUSTMENT OF AUTOMATIC WHITE AND BLACK

4.2 GENERAL

The adjustments described in this section are those which can be performed by a qualified service technician.

Proper maintenance and inspection are important both for ensuring top performance and preventing damage to the camera tube. Note that the required jigs must be employed when specified in the adjustment steps.

Precautions

IMPORTANT:

1. Always turn the power off before removing or soldering components.
2. When removing a screw from the chassis, be careful not to drop it into the mechanism. If a screw should be dropped, be sure to retrieve it.

The optical block has been precisely adjusted at the factory and ordinarily does not require adjustment.

When removing a part, be very careful not to damage or displace other parts.

4.3 INTRODUCTION

The procedure of this section is to be used for alignment of the video camera under 3200 K illumination.

If the video camera should fail, be sure to check all voltage and waveforms before attempting any adjustments. Note that correct operation is achieved only when all circuits are properly adjusted, and therefore, improper adjustment of a single "block" of circuits may disrupt all functions. The best procedures are to locate the cause of trouble first, then begin repair, replacement or adjustment.

4.4 ALIGNMENT EQUIPMENT

4.4.1 Equipment needed

The following equipment is required in order to perform the alignment.

1. **Oscilloscope** 1
   - Frequency response ca. DC 0–15 MHz
   - Voltage sensitivity More than 10 mV/div.
   - Probe 10 : 1, 1 : 1 one each
   - With delayed sweep

2. **Color monitor TV** 1
   - Color monitor TV compatible with the color system of the camera
   - Either over-scan type (provided with angle frame marks with a vertical and horizontal ratio of 3 : 4) or underscan type is usable.

3. **Monochrome monitor TV** 1
   - Underscan type is preferred.
   - Optional studio viewfinder is usable.

4. **Frequency counter** 1
   - Range for frequency measuring up to about 10 MHz
   - Input sensitivity about 100 mV rms
   - Indication digits more than 6

5. **DC voltmeter** 1
   - Digital voltmeter or high-precision tester (the one with little error) (accuracy with ±1%)

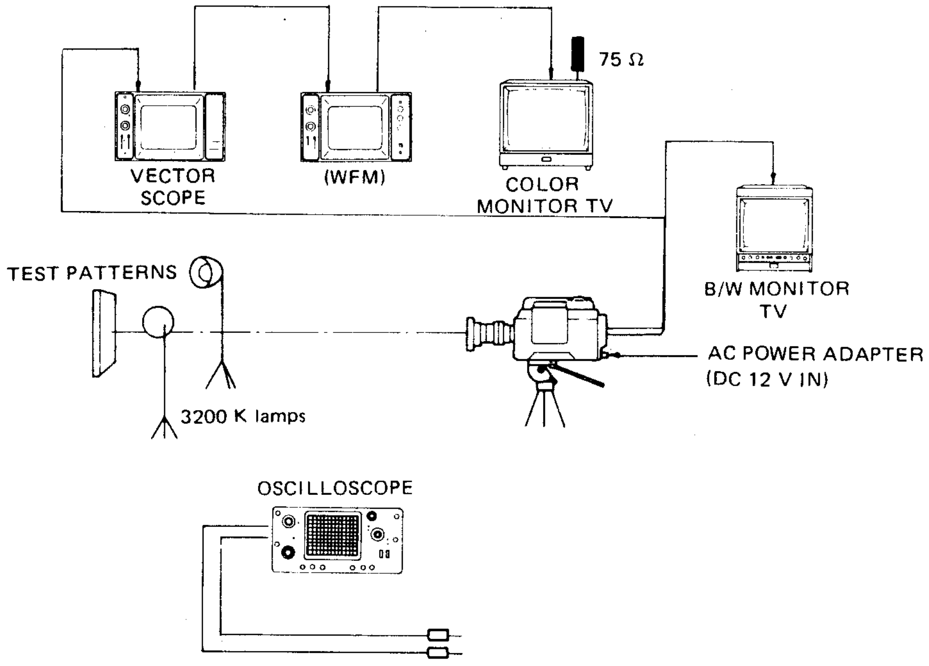
6. **Lighting instruments** . . . . 1 or 2 set(s)
   - Halogen lamps (frosted type) with 500 W and 3,200 K color temperature of equivalents

7. **Subject** . . . . one each
   - JVC gray scale pattern Part No. GS-2
     $\gamma = 2.2$, 11 steps, reflective type, adhered to currugated cardboard, and with angle frame marks indication in a vertical and horizontal ratio of 3 : 4.
   - Resolution EIA/RETMA or equivalent
   - Registration pattern EIA/RETMA or equivalent
   - JVC IN-MEGA CYCLE CHART
     Parts No. RESC-010

8. **Vectorscope** 1
   - Tektronix 520A, or equivalent

9. **Power supply** 1
   - AC adapter or DC power regulator (12 VDC, 2.5–3 A)

4.5 GENERAL SET-UP



75 Ω
VECTOR SCOPE
(WFM)
COLOR MONITOR TV
B/W MONITOR TV
TEST PATTERNS
AC POWER ADAPTER (DC 12 V IN)
3200 K lamps
OSCILLOSCOPE

Fig. 4-1 General set-up

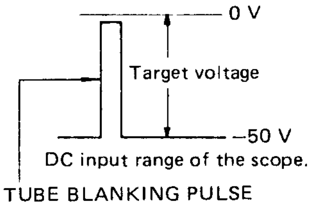
1. Lighting
   Be sure to use an illumination lamp offering 3,200 K color temperature. Also adjust illumination intensity of the pattern surface at approximately 2,500 lux (250 fc). Simultaneously adjust the distance between the camera lens and the pattern to maintain uniform illumination. In this instance, note that improper adjustment may produce a poor waveform.

2. Checking waveform of composite video signals
   Use the VIDEO OUT terminal on the TV monitor connected with a 75 Ω resistor to check the waveform of the composite video signals.

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

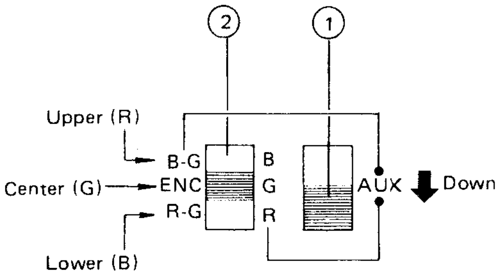
4.6 POWER SUPPLY (PS BOARD) VOLTAGE ADJUSTMENT

Note: ● If a supply voltage does not meet the required value, adjust following the procedure below. Note that, after performing the +9 V power adjustment, it is also necessary to perform the adjustment 4.7 "Electric Focus".

1	+9 V power adjustment	Digital voltmeter	PS board $\boxed{1}$ Pin 30 of CN1 RC board +9 V ADJ (R7)	(1) Take out PS Board $\boxed{1}$, attach on extension board and reset. (2) Take out the battery guide base. (refer to page 2-1, Fig. 2-2). There is +9 V ADJ VR (R7) behind the base. ... +9 V ± 0.1 V
2	Target voltage (Cathode blanking pulse adjustment)	Oscilloscope: H-rate: DC range	PS board $\boxed{1}$ Pin 5 of CN1 PS board $\boxed{1}$ T-BL (R18)	... 50 Vp-p ± 1 V  0 V Target voltage −50 V DC input range of the scope. TUBE BLANKING PULSE

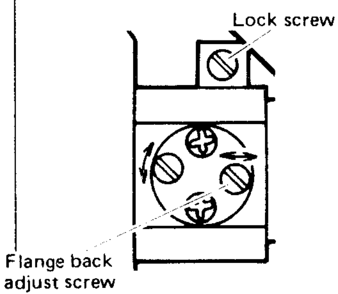
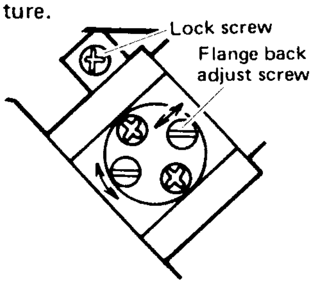
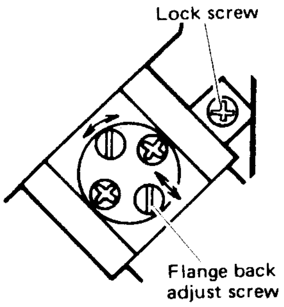
4.7 ELECTRIC FOCUS ADJUSTMENT

Note that, after the adjustment, registration adjustment is also necessary.

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
1	B, G, R electric-static focus adjustment	Registration chart (The distance to the camera shall be approx. 3 m.)	Connect a B/W monitor to TEST OUT.	(1) Set the VF/TEST OUT SELECT switches to "G". For instance, set ① switch to the bottom position, then set ② switch to the center.  ② ① Upper (R) B-G Center (G) ENC R-G Lower (B) B G R AUX Down **VF/TEST OUT SELECT switch**
			PS board 1 G FOCUS (R21) B FOCUS (R22) R FOCUS (R20)	(2) Turn the lens focus ring to adjust the focus. (3) Adjust the best focus point. (4) Adjust the R and B focus following the same steps as (1) to (3) above.

No.	Items	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

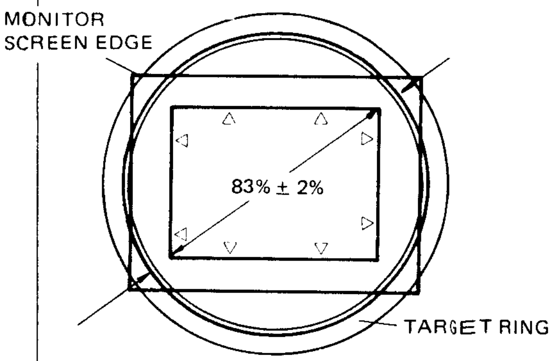
4.8 FLANGE BACK ADJUSTMENT

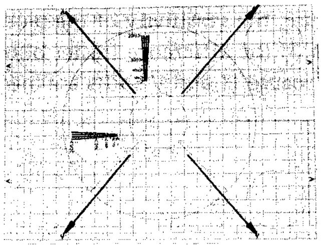
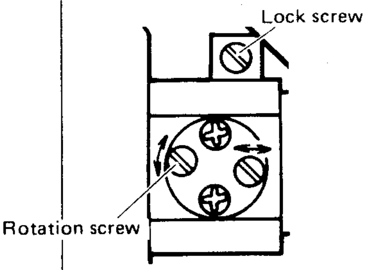
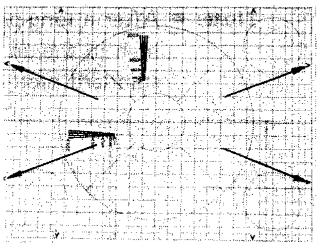
1	G channel flange back adjustment	Registration pattern	Connect a B/W monitor to TEST OUT. Monitor the G ch. video signal.  Zoom ring: TELE ↔ WIDE Adjust the focus.	(1) Reduce the illumination so that the lens aperture is fully open. (If a color temperature compensation filter or ND filter is to be used to decrease the amount of light, adjust the auto white balance before adjustment.) (2) Set the VF/TEST OUT SELECT switches to "G". (3) Set the lens F.f. adjust ring to the specified mark position. (4) Loosen the G channel yoke lock screw. (5) Set the lens zoom ring to the TELE (telephoto) position and turn the lens focus ring to adjust the focus. (6) Set the lens zoom ring to the WIDE position and turn the G channel flange back screw to adjust the focus. (7) Repeat steps (5) and (6) several times. (8) Secure the lock screw.
2	B channel flange back adjustment		Zoom ring: TELE ↔ WIDE Adjust the focus of the picture. 	(1) Set the TEST OUT select switches to "B". (2) Loosen the B ch. lock screw. (3) Adjust the focus following the same steps as (5) to (8) above.
3	R channel flange back adjustment		Zoom ring: TELE ↔ WIDE Adjust the focus of the picture. 	(1) Set the VF/TEST OUT SELECT switches to "R". (2) Loosen the R ch. lock screw. (3) Adjust the focus following the same steps as (5) to (8) above.

No.	Items	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

4.9 SCAN SIZE SETTING

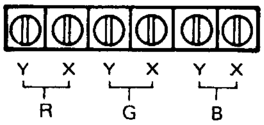
Note: ● After a long period of use, the sensitivity of the pickup tube is lowered in the used target area, and is relatively high in the unused area. If the difference (raster burn) is observed clearly, the setting becomes smaller than the standard picture size because H and V shifts are mechanically adjusted to meet the condition of the used area.

				● Check that the registration pattern is placed horizontally. ● Check that the camera is placed horizontally and level. ● Check that the chart and camera are positioned exactly opposite to each other. ● Set the AUTO SHIFT switch to the PRESET? position.
1	G channel scan size adjustment	Registration pattern	Connect a B/W monitor to TEST OUT. Use a zoom lens.	(1) Set the VF/TEST OUT SELECT switches to "G". (2) Set the SCAN SIZE switch (S2) on DF board to "OVER". (3) So that the registration chart on the monitor screen touches the inside of the target ring, adjust the camera position, angle and lens zooming.
				 83% of target ring diagonal
		Note: Hereafter until the adjustment step (9) is completed, do not move the position and angle of the camera and pattern or the position of the lens zoom ring.	DF board M-V AMP (R29) G-V SHIFT (R46)	(4) Ensure no eclipse is observed on the corners at "R" and "B" channels also, by selecting the VF/TEST OUT SELECT switch. (5) If necessary, adjust the (3) procedure. (6) Reset VF/TEST OUT select switches to "G". (7) Set the SCAN SIZE switch (S2) on DF board to "NOR". (8) Adjust M-V AMP (R29) and G-V SHIFT (R46) so that the "wedges" on upper and lower chart touch the inside of the raster. (9) If necessary, adjust the yoke rotation so that the scanning line and test pattern become parallel.

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
			 DF board M-H AMP (R81) G-H SHIFT (R43)  	 (9) Adjust MASTER-H AMP (R81) and G-H SHIFT (R43) so that the "wedges" on both sides of the chart touch the inside of the raster. **Note:** Do not touch M-V-LINEARITY (R20), MASTER-H-LIN (R170), G-SKEW (R62) and G-H-LIN (R104).
2	B channel scan size adjustment		DF board B-H AMP (L6) B-H SHIFT (R36) B-V AMP (R38) B-V SHIFT (R40)	(10) Set the VF/TEST OUT SELECT switches to "B". (11) Adjust so that the black and white images of the chart are superimposed on the B/W monitor screen. Horizontal direction Vertical direction Notice only the vertical and horizontal amplitudes. (12) If necessary, rotate the B ch. yoke paying attention only to the horizontal center line.
3	R channel scan size adjustment		DF board R-H AMP (L2) R-H SHIFT (R48) R-V AMP (R50) R-V SHIFT (R52)	(13) Set the VF/TEST OUT SELECT switches to "R". (14) Observing B/W monitor, adjust so that the black and white images of the chart are superimposed. Horizontal direction Vertical direction Notice only the vertical and horizontal amplitudes. (15) If necessary, rotate the R ch. yoke paying attention only to the horizontal center line.

4.10 ELECTRONIC BEAM ALIGNMENT

Note: ● Since the beam alignment has a close relationship to the scan size, it is preferable to perform alignment after the "Scan Size Setting" above, with the same setting conditions.

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
1	G channel beam alignment	Registration pattern or Resolution pattern	Connect a B/W monitor to TEST OUT. Set the AUTO SHIFT switch to "MANUAL". PS board 1 G-FOCUS (R21) MT-2 board G-X ALIGN (R7) G-Y ALIGN (R10) 	● Check that the chart and camera are positioned exactly opposite to each other. (1) Set the VF/TEST OUT SELECT switches to "G". (2) Turn G-FOCUS VR (R21) of PS board quickly by 20° to the left and right, and observe variation of focus. (3) If any variation of the pattern's center (movement up & down, left & right) is observed, perform adjustment. **Note:** If it is correctly adjusted, the pattern center seems to move only towards and away from. (4) Adjust G-FOCUS (R21) VR to obtain optimum focus. **Note:** Check there is no mesh beat interference. Adjust to the position giving optimum alignment without mesh beats.
2	B channel beam alignment		PS board 1 B-FOCUS (R22) MT-2 board B-X ALIGN (R6) B-Y ALIGN (R9)	(5) Set the VF/TEST OUT SELECT switches to "B". (6) Perform alignment following the same procedures as in steps (2) through (4) above.
3	R channel beam alignment		PS board 1 R-FOCUS (R20) MT-2 board R-X ALIGN (R8) R-Y ALIGN (R11)	(7) Set the VF/TEST OUT SELECT switches to "R". (8) Perform alignment following the same procedures as in steps (2) through (4) above.

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

4.11 BEAM CURRENT ADJUSTMENT

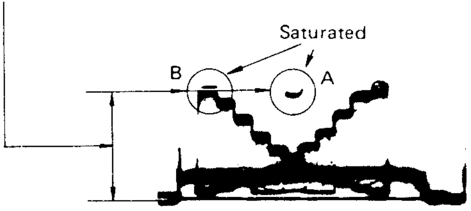
No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
1	BEAM adjustment (X2 BEAM)	Grey scale chart, Oscilloscope (H-rate: 10 : 1)		● An illumination of from 4,000 to 6,000 lux is required for the adjustment. Increase the brightness or place the light near the chart. ● Set the lens iris mode to "MANUAL". (1) Set the ABC VRs and CLIP VRs on PS board to fully counter clockwise. (2) Monitor the gray scale chart on full screen and adjust the lens iris. (3) Open the lens iris until the signal level slightly exceeds the specified value. (4) Adjust BEAM SET VRs to the point just before the signal peak begins to be clipped.
2	ABC adjustment		Lens iris	● An incandescent lamp is necessary for adjustments of step 2 and after. (1) Turn ABC VRs and CLIP VRs fully clockwise. (2) Shoot the incandescent lamp so that the width becomes 10 μsec in horizontal period. (3) Open the lens iris so that the signal level slightly exceeds the specified value in table 4-11-3. (4) Slowly turn the ABC VR counter clockwise. (5) Adjust to the point just before a change is observed in the rise condition of the waveform (white peak).

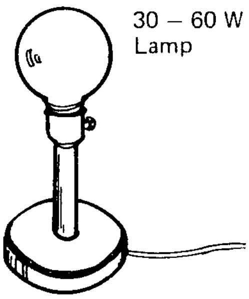
PA board	Video signal level	VR	
		PS board 1	
B TP1	0.4 V	B BEAM SET R39	ABC VRS – fully CCW
G TP2	0.4 V	G BEAM SET R45	
R TP3	*	R BEAM SET R51	CLIP VRs – fully CW

Table 4-11-1

* Adjust the R BEAM SET as same iris opening as the G BEAM SET.

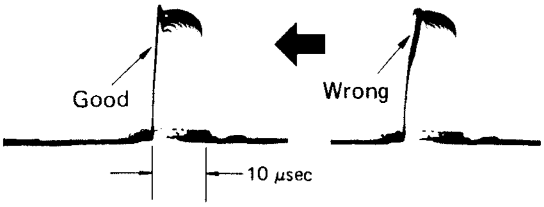
A : JVC greyscale
B : EIA greyscale





PA board	Video signal level	VR	
		PS board 1	
B TP1	Saturated	B ABC R37	
G TP2	Saturated	G ABC R43	
R TP3	Saturated	R ABC R49	

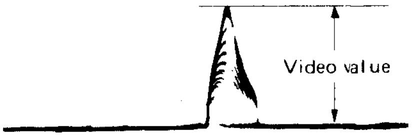
Table 4-11-2



No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
3	BEAM CLIP adjustment (X8 BEAM)	Incandescent lamp, Oscilloscope (H rate: 10 : 1)	 Lens iris	**Note:** This adjustment is performed with an incandescent lamp (about 60 W) as the object. Since this may lead to burn if the lamp is shot for long a minute without correct adjustment, the operation should be done quickly. (1) Open the lens iris aperture so that the signal level slightly exceeds the specified value. (2) Adjust BEAM CLIP VRs to the points just before the signal peak begins to get clipped.

PA board		Video signal level	VR		
			PS board 1		
B	TP1	1.0 V	B	BEAM CLIP	R41
G	TP2	1.6 V	G	"	R47
R	TP3	1.2 V	R	"	R67

Table 4-11-3



No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

4.12 PREAMP (PA BOARD) ADJUSTMENT

- The following adjustment is unnecessary at ordinary servicing.

1	Streaking adjustment	Grey Scale	PA board LF Trimmer capacitor	Warm up the camera for an hour in a room at a temperature of 20°C to 25°C before starting to adjust the video amplifier. (1) Prepare a large piece of black cloth with white paper glued in the middle. This serves as the test pattern (Fig. 4-12-1). (2) Illuminate the test pattern with about 3,000 lux (300 fc). (3) For the G-channel, connect an oscilloscope to TP-2 and set its time division to 20 μsec and vertical gain at 0.1–0.2 V/cm. (4) Open the lens aperture so that the signal voltage becomes about 0.16 V. (5) The waveform is normally B shown in Fig. 3-12-2. If it is not, adjust LF trimming capacitor. (6) For the R and B channels, check the waveform at each test point with the aperture set in step (4) and adjust the associated LF trimming capacitor in the preamplifier.

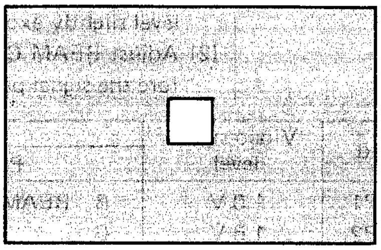


Fig. 4-12-1 Example of test pattern

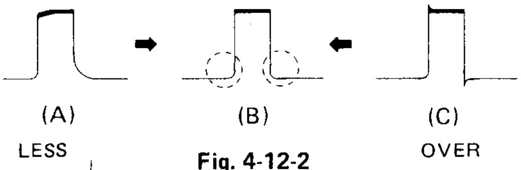


Fig. 4-12-2

Channel	Test point	Adjustment	
	PA board	PA board	
B	TP-1	B-LF	C101
G	TP-2	G-LF	C201
R	TP-3	R-LF	C301

Table 4-12-1

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

4.13 REGISTRATION ADJUSTMENT

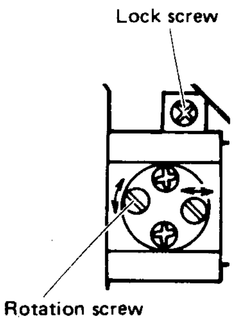
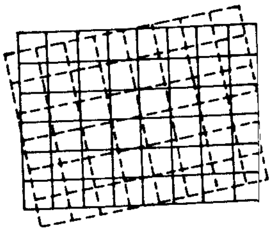
Note: 1. When the pickup tube is not replaced, this adjustment is performed using the G channel as the reference for other channels. Therefore, do not touch the controls of G channel such as the centering, skew, vertical/horizontal scan sizes and linearity control.
To obtain optimum registration, it is only necessary to adjust R and B.

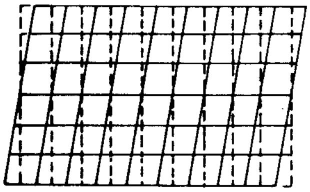
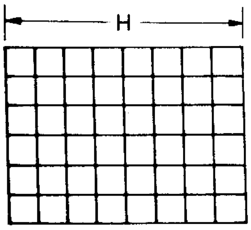
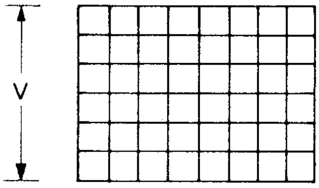
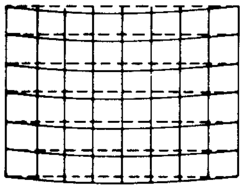
2. Influence of incident light
Incident light exerts a great influence on registration. Especially if the light is bright and the background very dark, misregistration will be so large that it may be observed even on the monitor screen. And this misregistration will not be able to be adjusted by adjusting the camera.
When adjusting the registration, manually adjust the iris so that the signal level is 70% of the video output.

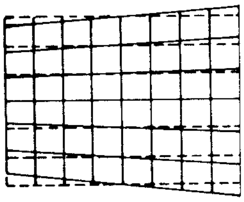
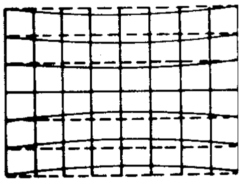
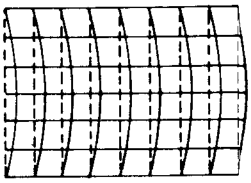
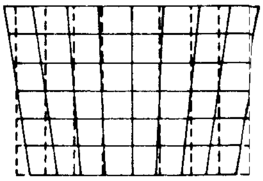
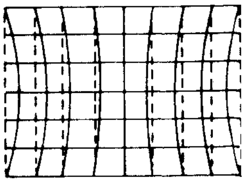
3. Removal and reinsertion of circuit board
When adjusting, it is frequently necessary to install extension boards to circuit boards. In such cases, be sure to close the optical filter and switch off the power before operation, to prevent damage to the pickup tube.

4. Zoom lens
The sizes of images on the R, G and B pickup tubes depend on the zooming of the zoom lens. If the registration pattern is displayed as full-screen size when zooming nearly in the middle between tele- and wide-angle, it means that the distance between the camera and chart are ideal.

5. Monitor
The registration adjustment is to be performed with a B/W monitor: It is not possible to use a color monitor.

1	Rotation adjustment • The rotation adjustment may sometimes result in a change of back focus: Be sure to check the camera tube back focus after adjusting.	Registration pattern	Connect a B/W monitor to TEST OUT.  R channel ; Yoke rotation DF board – R-V SHIFT(R52) DF board – R-H SHIFT(R48) B channel ; Yoke rotation DF board – B-V SHIFT(R40) DF board – B-H SHIFT(R36)	• Warm up the camera with the optical filter disc at position "1" (closed) for 30 minutes. • Check that the registration pattern is placed horizontally. • Check that the camera is placed horizontally and level. • Check that the registration pattern and camera are positioned exactly opposite to each other. (1) Set the lens iris so that the video output is 70% or that the PA board TP2 (G-ch) is 0.14 Vp-p approx. (2) Set the VF/TEST OUTPUT SELECT switches to "R-G". (3) Adjust so that the horizontal center lines of the black and white images are superimposed on the B/W monitor screen.  (4) Set the VF/TEST OUTPUT SELECT switches to "B-G". (5) Adjust so that the horizontal center lines of the black and white images are superimposed on the B/W monitor screen.

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
2	Skew adjustment		DF board B-SKEW (R61) R-SKEW (R63)	(6) Adjust so that the vertical center lines are superimposed on the B/W monitor screen.  **Note:** Do not touch G-SKEW (R62)
3	Horizontal amplitude & linearity adjustment		DF board B-H AMP (L6) R-H AMP (L2) B-H LIN (R93) R-H LIN (R104)	(7) Adjust so that all the vertical lines are superimposed on the B/W monitor screen.  **Note:** Since the adjustment using R/B LIN causes a variation of amplitude, it is necessary to always control the R/B SHIFT VR to align the center line during adjustment.
4	Vertical amplitude & linearity adjustment		DF board B-V AMP (R38) B-V LIN (R22) R-V AMP (R50) R-V LIN (R24)	(8) Adjust so that all the horizontal lines are superimposed on the B/W monitor screen. 
5	Vertical bow distortion adjustment		DF board B-V BOW (R146) R-V BOW (R144)	• Since bow, trapezoidal and pincushion distortions have a certain relationship, it is important to start adjustment with the most obvious distortion. Take care not to rotate the VRs too much, as over-correction may cause new distortions in different parts. (9) Observe the B/W monitor and adjust so that the solid lines below are correctly superimposed.  **V-BOW distortion**

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
6	Vertical trapezoidal distortion adjustment		DF board B-V TRAP (R119) R-V TRAP (R129)	(10) Observe the B/W monitor and adjust so that the solid lines below are correctly superimposed.  V-TRAPEZOIDAL distortion
7	Vertical pincushion distortion adjustment		DF board B-V PIN (R120) R-V PIN (R130)	(11) Observe the B/W monitor and adjust so that the solid lines below are correctly superimposed.  V-PINCUSHION distortion
8	Horizontal bow distortion adjustment		DF board B-H BOW (R5) R-H BOW (R7)	(12) Attach an extension board to H·DEF board and set. (13) Observe the B/W monitor and adjust so that the solid lines below are correctly superimposed.  H-BOW distortion
9	Horizontal trapezoidal distortion adjustment		DF board B-H TRAP (R152) R-H TRAP (R151)	(14) Observe the B/W monitor and adjust so that the solid lines below are correctly superimposed.  H-TRAPEZOIDAL distortion
10	Horizontal pincushion distortion adjustment		DF board B-H PIN (R3) R-H PIN (R1)	(15) Observe the B/W monitor and adjust so that the solid lines below are superimposed correctly.  H-PINCUSHION distortion

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
11	**• The following linearity adjustment is unnecessary at ordinary servicing since special test pattern and signal generator are required.**			
	G channel linearity	Ball test chart EIA/RETMA standard	DF board M-V AMP (R29) M-V LINEARITY (R20) M-V PIN (R112) M-H AMP (R81) M-H LINEARITY (R170) M-H PIN (R26)	• This adjustment is not a routine adjustment. (1) Hook up the carnera and test equipment as follows.

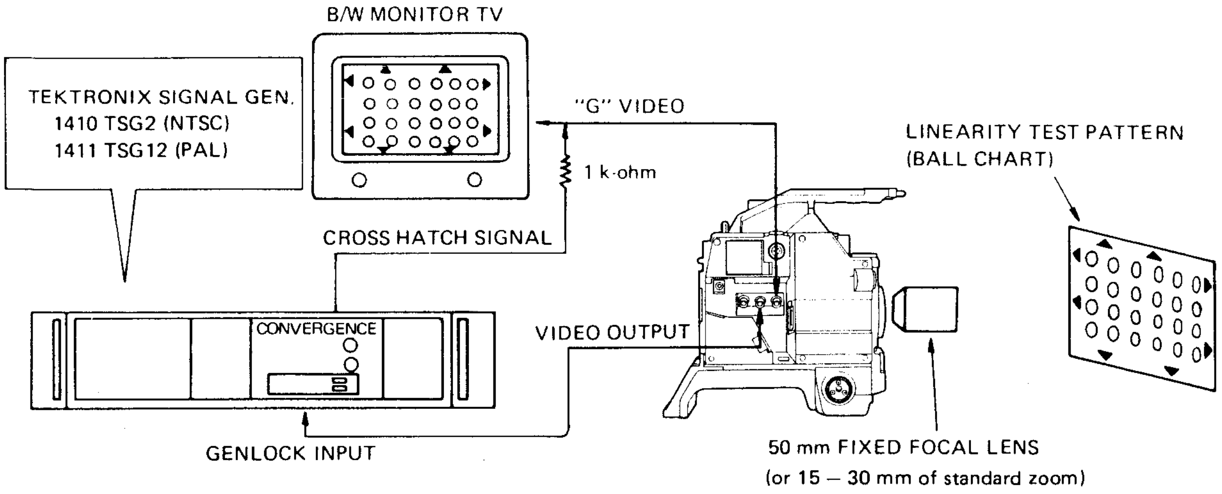
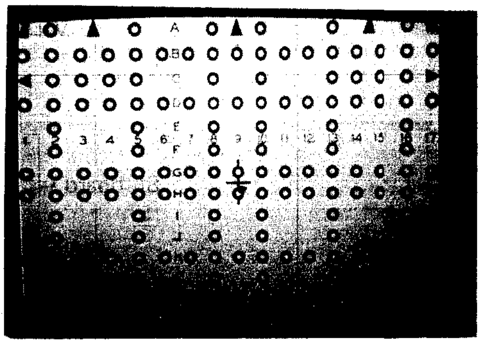
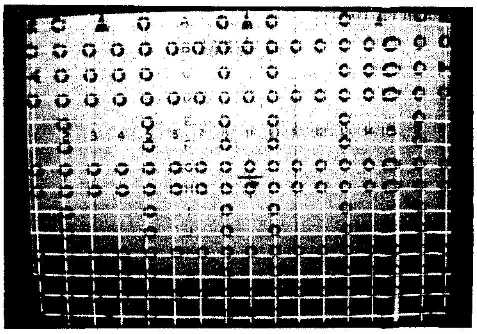
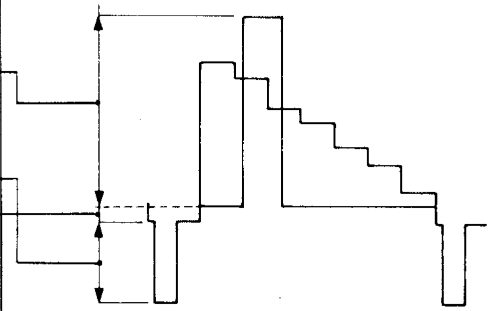
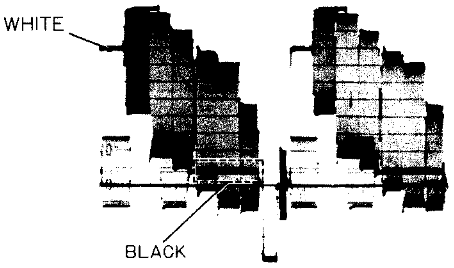

B/W MONITOR TV
TEKTRONIX SIGNAL GEN.
1410 TSG2 (NTSC)
1411 TSG12 (PAL)
"G" VIDEO
1 k-ohm
CROSS HATCH SIGNAL
CONVERGENCE
VIDEO OUTPUT
GENLOCK INPUT
LINEARITY TEST PATTERN
(BALL CHART)
50 mm FIXED FOCAL LENS
(or 15 – 30 mm of standard zoom)

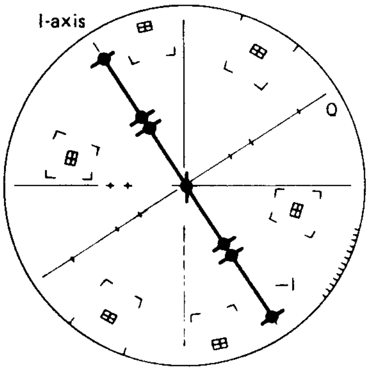
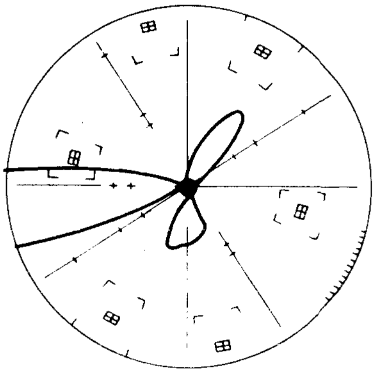
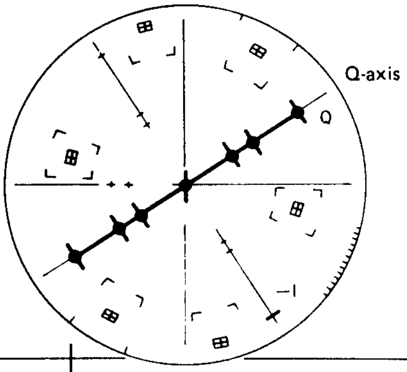
Fig. 4-13-1 Connection of test equipment

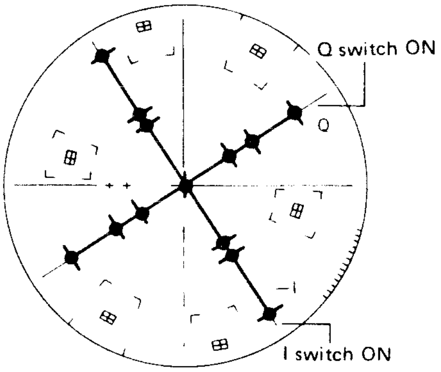
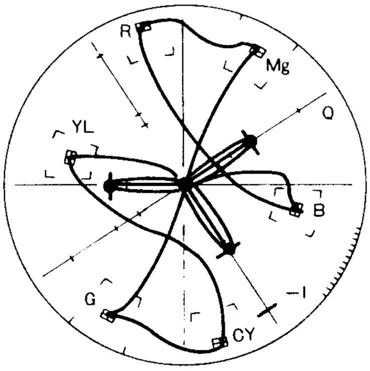
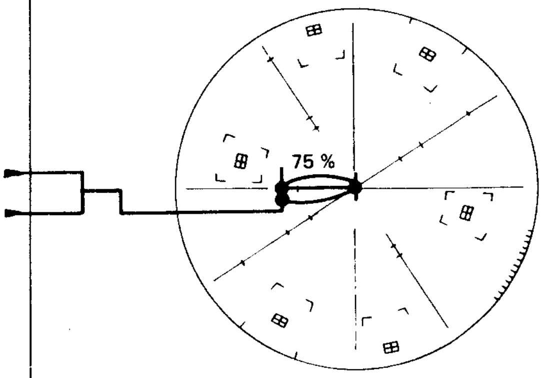
No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
				(2) Superimpose the ball test chart picture and cross hatch test signal on the B/W under-scanned type professional monitor TV. (3) Adjust the camera distance and position so that the test pattern picture just fills the monitor TV screen. (4) Adjust VERTICAL POSITION and HORIZONTAL POSITION of the cross hatch generator panel so that the center of test card picture and cross hatch signal are coincide. (5) Adjust the above mentioned potentiometers if the all cross points are not within or touch the circle of the test card.  **Fig. 4-13-2** Picture size  **Fig. 4-13-3** Linearity test

4.14 ENCODER ADJUSTMENT (NTSC)

Note: ● When a vectorscope is not used, just perform the checks and adjustments in "1. Bars level adjustment" and "2. Carrier balance adjustment", item (1) and (2).

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
1	Bars level adjustment	Oscilloscope (H rate: 10 : 1) or WFM	VIDEO OUTPUT (0.714 Vp-p) 100 IRE ± 1 IRE SE board 5 – Y GAIN (R188) (0.286 Vp-p ± 0.01 V) 40 IRE ± 5 IRE SE board 5 – SYNC LEVEL (R97) (53 mVp-p ± 7 mV) 7.51 IRE ± 1 IRE	● Set the filter disc to "1" (closed). ● Connect a vectorscope and WFM to the VIDEO OUTPUT terminal and terminate with a 75-ohm termination impedance. ● Set the BARS switch to "ON". (1) Take out SE board 5, attach an extension board and reset. (2) Set both the I-AXIS switch (S6) and Q-AXIS switch (S7) of SE board to OFF. (3) The Y LEVEL and SYNC LEVEL are related each other; adjust them repeatedly. 
2	Carrier balance adjustment	Oscilloscope (H rate: 10 : 1) or WFM Vectorscope	SE board 5 I CARRIER BAL (R169) Q CARRIER BAL (R168)	(1) Set both the I-AXIS switch and Q-AXIS switch to ON. (2) Turn the VRs alternatively so that the carrier leakage of WHT and BLK is minimized. It is important to adjust alternatively and repeatedly since the two VRs are related to each other.  (3) When using a vectorscope, set the gain of vectorscope at maximum then set so that the spot comes to the center and minimize the circle.

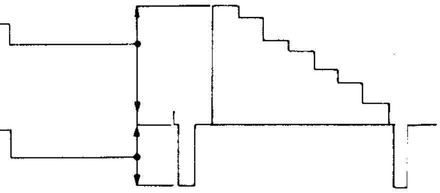
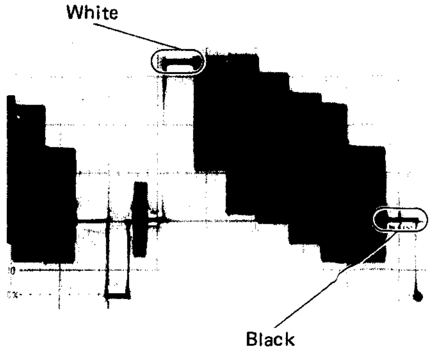
No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
3	I axis gain adjustment **Always perform the I-axis gain adjustment first, and then the Q-axis gain adjustment.**	Vectorscope	Connect a vectorscope to the VIDEO OUTPUT connector (BNC). SE board 5 CHROMA LEVEL (R142) 	 (1) Set as follows: I-axis switch (S6) → ON Q-axis switch (S7) → OFF (2) Set the gain of the vectorscope to CAL or to 75% (preset position). (3) Adjust the PHASE of the vectorscope so that the I-axis signal is superposed on the I-axis line. (4) Adjust CHROMA LEVEL so that the six spots of I-axis signal are positioned correctly indide the six spot marks of the I-axis.
4	Q-axis gain adjustment	Vectorscope	SE board 5 Q-GAIN (R156) 	(1) Set as follows: I-axis switch (S6) → OFF Q-axis switch (S7) → ON (2) Adjust Q-GAIN so that six Q-axis spots come exactly on the spot marks of the Q axis.
5	Quadrature phase adjustment	Vectorscope	SE board 5	(1) Set as follows: I-axis switch (S6) → OFF Q-axis switch (S7) → ON (2) Adjust the PHASE control of vectorscope so that the Q-axis signal is superimposed on the Q-axis. (3) Set as follows: I-axis switch (S6) → ON Q-axis switch (S7) → OFF

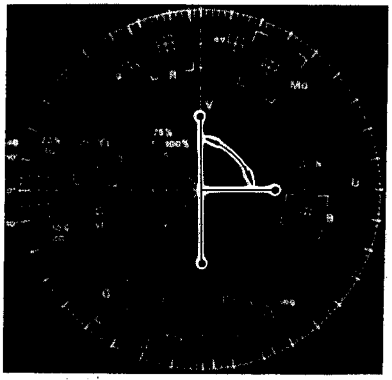
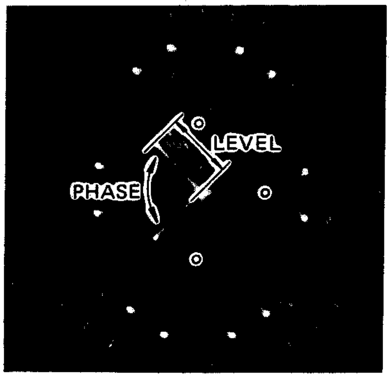
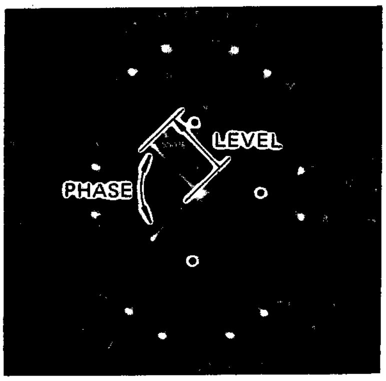
No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
			SE board $\boxed{5}$ QUADRATURE (R116)	(4) Adjust the QUADRATURE VR so that the I-axis signal is superimposed on the I-axis. (5) Repeat items (1) through (4) so that the axis cross each other exactly perpendicularly.  (6) Set as follows: I-axis switch (S6) → ON Q-axis switch (S7) → ON  When all the adjustments above are performed correctly, all of the spots (R, G, B, M_G, C_Y, Y_L,) will be in their specified positions on the vector-scope.
6	Burst phase & burst level adjustment	Vectorscope	SE board $\boxed{5}$ BURST PHASE (R160) BURST LEVEL (R150)	(1) Adjust the burst phase and level. 

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

4-14-P ENCODER ADJUSTMENT (PAL)

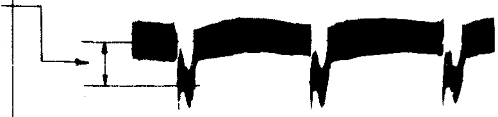
Note: ● When a vectorscope is not used, just perform the checks and adjustments in "1. Bars level adjustment" and "2. Carrier balance adjustment", item (1) and (2).

1	Bars level adjustment	Oscilloscope (H rate: 10 : 1) SE board $\boxed{5}$	VIDEO OUTPUT 0.7 V Y GAIN (R102) 0.3 V SYNC LEVEL (R109)	● Set the filter disc to "1" (closed). ● Connect a vectorscope and WFM to the VIDEO OUTPUT terminal and terminate with a 75-ohm termination impedance. ● Set the BARS switch to "ON". (1) Take out SE board $\boxed{5}$, attach an extension board and reset. (2) Set both the U-AXIS switch (S6) and V-AXIS switch (S5) of SE board to OFF. (3) Adjust Y GAIN and SYNC. 
2	Carrier balance adjustment	Oscilloscope (H-rate; 10 : 1) or WFM Vectorscope	SE board $\boxed{5}$ CARRIER BAL (R172) CARRIER BAL (R173) CARRIER BAL (R174) SE board $\boxed{5}$ W. BAL 1 (R135) W. BAL 2 (R151)	(1) Set both the U-AXIS switch and V-AXIS switch to ON. (2) Set R174 mechanicla center, then, turn the VRs R172 and R173 alternatively so that the carrier leakage of Black is minimized. It is important to adjust alternatively and repeatedly since the two VRs are related to each other.  (3) Adjust R135 and R151 alternatively to minimize the carrier leakage of white. (4) Adjust the R174 to minimize carrier leakage of each lines. The R174 minimizes the carrier leakage of V-axis.

No.	Item	Measuring Insturments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
3	Quadrature phase adjustment	Vectorscope	SE board $\boxed{5}$ QUAD PHASE (R128)	(1) Set as follows: V-axis switch (S5) ON U-axis switch (S6) ON (2) Adjust the QUAD PHASE R128 so that the U-axis signal perpendicular to the V-axis on the vector scope. 
4	Colour vector adjustment	Vectorscope	SE baord $\boxed{5}$ CHROMA LEVEL (R188) U-GAIN (R159) **Always perform the CHROMA LEVEL adjustment first, and the U-axis gain adjustment.**	(1) Adjust CHROMAL LEVEL (R188) and U-GAIN (R159) VRs so that all of the colour dots are in their spefied positions on the vectorscope. (2) Readjust QUAD PHASE (R128) if necessory. 
5	Burst phase & burst level adjustment	Vectorscope	SE board $\boxed{5}$ BURST PHASE (R181) BURST LEVEL (R162)	(1) Adjust the burst phase and level (0.3 V). 

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

4.15 BIAS LIGHT

1	Bias light	Oscilloscope	PA board / *Video level R TP1 3–6 mVp-p G TP2 5–10 mVp-p B TP3 4–10 mVp-p * Use 1 to 1 probe.	● Set the filter disc to "1" (closed). (1) It is not necessary to adjust anything, but only check at the measuring points. 

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

4.16 STATIC SHADING ADJUSTMENT

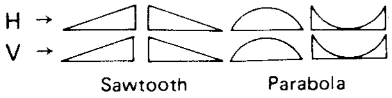
<table>
<tr>
<td>1</td>
<td>Static shading adjustment</td>
<td>Oscilloscope:
H-rate:
V-rate:</td>
<td>Connect a vectorscope to the TEST OUTPUT.
<table>
<tr><td></td><td>Test point</td><td>VR:
PA board</td></tr>
<tr><td>B</td><td>Test output</td><td>STATIC-SH VRs</td></tr>
<tr><td>G</td><td>"</td><td></td></tr>
<tr><td>R</td><td>"</td><td></td></tr>
</table>
H FRAM
BAL (R72)
CLIP (R84)
V FRAM
BAL (R75)
CLIP (R81)

B-H FRAME (R152)
G-H FRAME (R252)
R-H FRAME (R352)

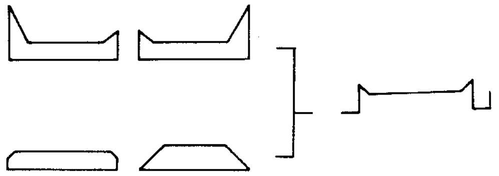
B-V FRAME (R150)
G-V FRAME (R250)
R-V FRAME (R350)</td>
<td>

- Close the lens cap or set the filter disc to "1" (closed).
- Set the WHITE BAL. (white balance) switch on the side of camera to PRESET.
- Set the AT board [5] AUTO BLK switch (S1) to OFF.
- Set the HI-SENS. switch to "+18 dB".
- Set the AUTO SHIFT switch on the front of the camera to MANUAL.
- Adjust the MASTER BLACK VR so that black level up to 140 mV.

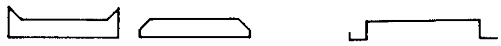
(1) Select the R, G, B channels respectively to use VF/TEST OUT SELECT switch.
(2) If static shading is observed, correct by advancing the VRs of the corresponding channels shown below.



(3) Find the channel with most obvious framing shading (⊔) (for both H and V) by means of TEST output.
(4) Adjust the FRAME BAL (frame balance) and CLIP of the largest channel to minimize the edge shading.
Separate adjustment VRs are not provided for each of the R, G and B channels.



(5) Adjust the H FRAME and V FRAME of each channel to minimize the edge shading.


</td>
</tr>
</table>

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

4.17 BLACK BALANCE ADJUSTMENTS

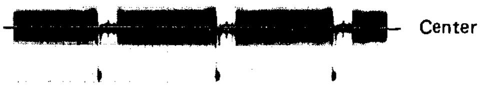
No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points
1	Black balance	Oscilloscope: (H-rate: 10 : 1) DC range	

	Test point	VR: PA board
B	TEST output B	BLACK BAL B (R130)
G	TEST output G	BLACK BAL G (R230)
R	TEST output R	BLACK BAL R (R330)

Note:
This adjustment is related to "4.19 BLACK LEVEL ADJUSTMENT". Black balance adjustment is performed so that the noise level center does not vary when gain is switched between 0 dB and +18 dB and is not adjusted with the BL (blanking) pulse level. The DC levels between channels vary according to the positions of the B-BLACK (R26) and R-BLACK (R31) potentiometers on the PR board [2]. The adjustment of the DC levels is described in section 3.19. However, the adjustment may not be possible if the B-BLACK (R26) and or R-BLACK (R31) are rotated too far.

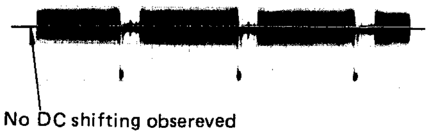
- Close the lens cap or set the filter disc to "1" (closed).
- Set the WHITE BAL. switch on the side of the camera to PRESET.
- Set the PR board AUTO BLK switch (S1) to OFF.

(1) Connect an oscilloscope to TEST OUTPUT with 75-ohm termination.
(2) Set the HI-SENS switch to "0 dB".
(3) Select VF/TEST OUTPUT SELECT switches to G channel.
(4) Adjust MASTER BLACK VR of the Test output select box so that noise in the image scanning period is clipped at the center. (Refer to 3.19 VIDEO OUTPUT GAIN AND BLACK LEVEL ADJ, No. 1 G channel black level adjustment).



Auto BLACK SW position : Auto BLACK

(5) Select VF/TEST OUTPUT SELECT switches to respective channel.
(6) Adjust the VRs while depressing the Auto white/Auto black switch to Auto BLACK side.
(7) Switch the HI-SENS switch alternately between "0 dB" and "+18 dB" positions and adjust so that the noise center does not move in the way DC level does.



No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

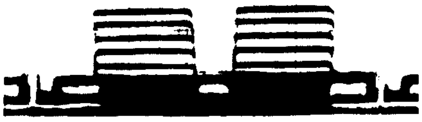
4.18 INPUT GAIN ADJUSTMENT (INPUT LEVEL SETTING)

<table>
<tr>
<td>1</td>
<td>Input gain adjustment</td>
<td>Grey scale chart
Oscilloscope:
(H-rate: 10 : 1)</td>
<td>3200 K illumination

<table>
<tr><th></th><th>PA board</th><th>Level</th></tr>
<tr><td>G</td><td>TP2</td><td>0.20 Vp-p</td></tr>
</table>

<table>
<tr><th></th><th>PR board</th><th>Level</th><th>VR: PA board</th></tr>
<tr><td>B</td><td>TP1</td><td>1.2 Vp-p</td><td>B-IN GAIN (R112)</td></tr>
<tr><td>G</td><td>TP2</td><td>1.2 Vp-p</td><td>G-IN GAIN (R212)</td></tr>
<tr><td>R</td><td>TP3</td><td>1.2 Vp-p</td><td>R-IN GAIN (R312)</td></tr>
</table>
</td>
<td>

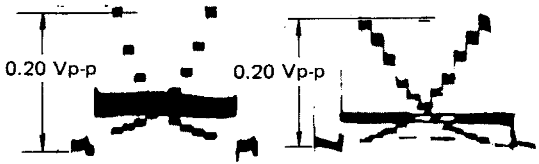
- Set the WHITE BAL. switch on the side of the camera to PRESET.
- Set the AT board switches AUTO BLK (S1) to PRESET.
- Set the HI-SENS switch to "0 dB".
- Check that the camera and grey scale chart are positioned exactly opposite each other.
- Check that the lighting is uniform.
  Connect an oscilloscope to the PR board test point TP1 (B ch.), observe with V-rated period and adjust the lighting so that the video signal becomes flat (average).



- Set the lens iris mode to MANUAL.

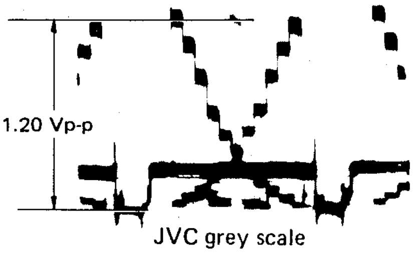
(1) Adjust the lens iris aperture to obtain the specified signal level (100%).

Note: Do not touch the lens iris control from now on until B and R gain settings are completed.

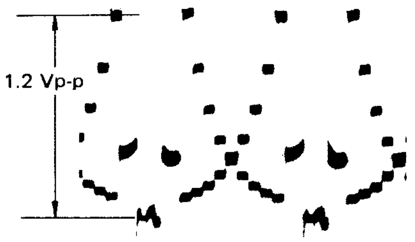


EIA log. grey scale JVC grey scale

(2) Check that the signal levels are as specified.



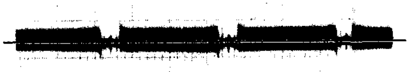
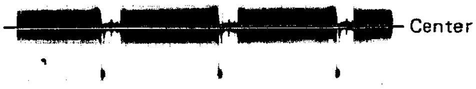
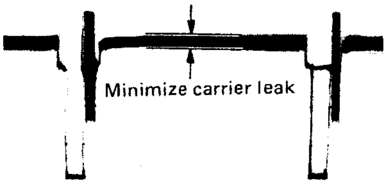
JVC grey scale



EIA log. grecy scale
</td>
</tr>
</table>

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

4.19 VIDEO OUTPUT GAIN AND BLACK LEVEL ADJUSTMENT

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
1	G channel black level adjustment	Lens capped Oscilloscope: (H-rate: 10 : 1)	SE board $\boxed{5}$ TP9 MASTER BLACK	● Set the WHITE BAL. switch on the side of the camera to PRESET. ● Set the AT board $\boxed{4}$ switches AUTO BLK (S1) to PRESET. ● Set the HI-SENS switch to "0 dB". ● Set the CC board $\boxed{3}$ CONTOUR switch to OFF. ● Check that the adjustments of "4.14 ENCODER ADJUSTMENTS" are correct. (1) Set the optical filter to "1" (closed). (2) Connect an oscilloscope to SE board test point TP9. (Time axis: 10 μs) (3) Adjust the M-BLACK VR while depressing the AUTO WHITE/BLACK switch under the camera to the AUTO BLACK side. (4) Adjust M-BLK VR so that the center of noise in the image scanning period coincides with T. BL pulse.  Auto black SW position : MEMORY ⬇  Auto black SW position : AUTO BLACK
2	R and B black level adjustments			(5) Connect an Oscilloscope to VIDEO OUTPUT with 75-ohm termination. (6) Turn B- and R-BLACK VRs (R31, R26) alternately until the image scanning period carrier is minimized.  (7) For each channel, switch the HI SENS switch between 0 dB and +18 dB, and check that the DC value of the noise center does not vary. If any variation is observed, perform "4.17 BLACK BALANCE ADJUSTMENT" again.

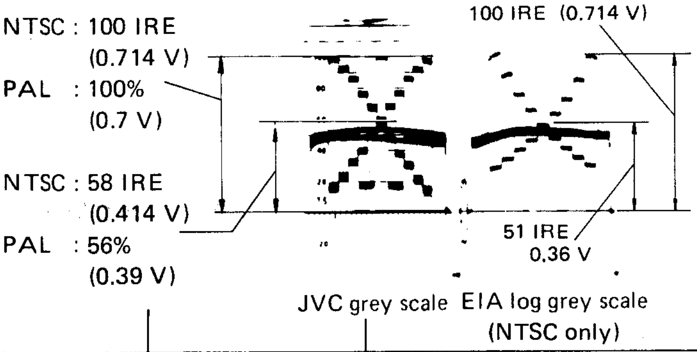
	Test point	Level	VR: PR board $\boxed{2}$
R B	VIDEO output (75 Ω Termination)	Noise minimized	R BLACK (R31) B BLACK (R26)

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

Position the grey scale pattern exactly opposite the camera.
Illuminate the chart with 3200 K color temperature lighting to obtain approx. 3000 lux uniform light.
Turn the PR board VRs of W-CLIP and KNEE fully counterclockwise to clear.

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
3	Gain and gamma adjustments	Grey scale 3200 K illumination Oscilloscope: (H-rate: 10 : 1)		(1) Set the filter disc switch to "2" (3200 K). (2) Display the grey scale chart in full-screen. (3) Adjust the lens iris aperture so that the PR board TP2 outputs 1.2 V.

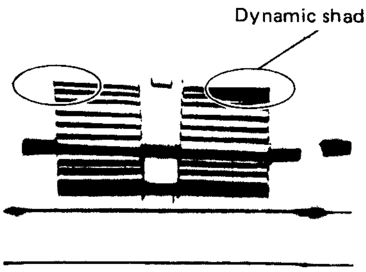
		PR board	VIDEO level	VR: PR board
		TP2	VIDEO OUT	G-GAIN (R231) G-GAMMA (R228)
WHITE	NTSC	1.2 V	0.714 V (100 IRE)	R-GAIN (R331)
	PAL		0.7 V (100%)	B-GAIN (R131)
CROSS POINT	NTSC		0.414 V (58 IRE)	R-GAMMA (R128)
	PAL		0.39 V (56%)	B-GAMMA (R328)



(4) Turn the VRs one after another that the carrier leak is minimized in video signal of white and cross point.

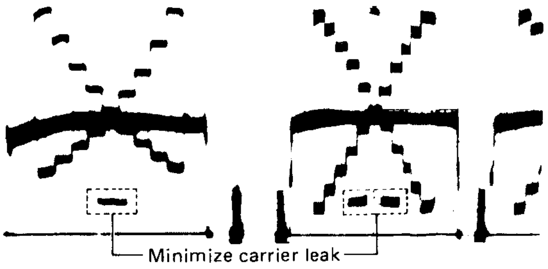
(5) Note that the video signal levels are within the specified levels and that the carrier leakage is minimized.

Note: If the levels do not correspond, slightly turn PR board G-GAIN VR (R231) then R-GAIN (R331) and B-GAIN (R131) alternately, so that the carrier leak is minimized.

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
4	Dynamic shading adjustment	Oscilloscope: (V-rate: 10 : 1) Grey scale chart	VIDEO OUTPUT PA board G-DYNAMIC (R226) R-DYNAMIC (R326) G-DYNAMIC (R228) R-DYNAMIC (R328)	(1) Adjust the lens iris so that the white level of VIDEO OUT is 0.7 Vp-p. The grey scale chart should be illuminated so that f/4 to 5.6 is convenient. (2) If dynamic shading is observed at the white grey scale pattern signal, adjust at the PR board as follows.  Dynamic shading (3) Adjust the above VRs alternately until the dynamic shading is minimized.

<table>
<tr><th>No.</th><th>Item</th><th>Measuring Instruments</th><th>Measuring Points, Adjusting Levels & Adjusting Points</th><th>Procedures</th></tr>
<tr>
<td>5</td>
<td>Flare compensation</td>
<td>Grey scale chart</td>
<td>
<table>
<tr><th></th><th>Level</th><th>PR board $\boxed{2}$</th></tr>
<tr><td>G</td><td>1.2 V</td><td>TP2</td></tr>
</table>

VIDEO OUTPUT

PR board $\boxed{2}$
R-FLARE (R38)
</td>
<td>
- Take out PR board, attach an extension board and reset.
- Turn the PR board VR R-FLARE (R38) fully counterclockwise.
- Set the lens iris switch to MANUAL.
(1) Adjust the lens iris so that the PR board TP2 outputs 1.2 Vp-p.
This adjustment should be done between f/4 and 5.6
(2) Set the filter disc to "1" (closed).
(3) Connect an oscilloscope to VIDEO OUTPUT.
(4) Check that the black balance is adjusted correctly.
(5) Set the filter disc to "2" (3200 K).
(6) Adjust so that the carrier leak is minimized on the black chip of the grey scale pattern.


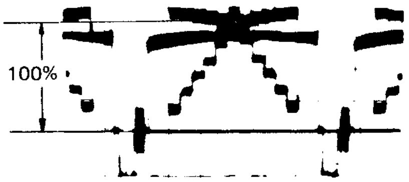
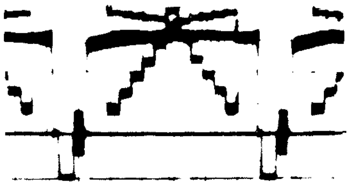
EIA grey scale JVC grey scale
</td>
</tr>
</table>

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

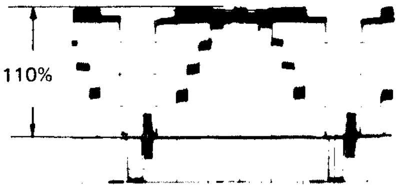
4.20 KNEE SLOPE AND WHITE CLIPPING ADJUSTMENTS

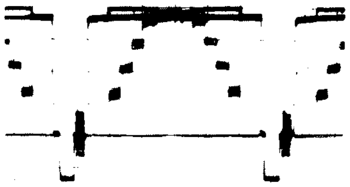
1	Knee slope adjustment	Grey scale Oscilloscope: (H-rate: 10 : 1)	VIDEO OUTPUT	● This adjustment should be performed after the gamma, output gain and black balance have been adjusted correctly. ● Terminate the VIDEO OUTPUT terminal or WFM using a 75-ohm termination resistance. ● Turn the PR board VRs R/G/B KNEE (R116, 216, 316) and R/G/B CLIP (R138, 238, 338) fully counterclockwise (off). (1) Adjust the lens iris manually so that the white level of video output is 100%. (2) Adjust G-KNEE (R216) from 100% to the point where carrier leakage is about to occur.

	Test Point	Level	VR: PR board 2
NTSC	VIDEO OUTPUT (75-ohm terminated)	0.714 V (100 IRE)	G-KNEE (R116) B-KNEE (R216) R-KNEE (R316)
PAL		0.7 V (100%)	

			NTSC : 100 IRE ± 5 IRE	(3) Set the HI-SENS switch at +9 dB.  (4) Alternately turn R- and B-VRs to minimize the carrier leak in the white part. 
2	White clipping adjustment		VIDEO OUTPUT	(1) Set the HI-SENS switch to +18 dB. (2) Adjust G-W CLIP so that the lower limit of carrier leakage is 110%.

	Test Point	Level	VR: PR board 2
NTSC	VIDEO OUTPUT	0.785 V (110 IRE)	G-W CLIP (R238) B-W CLIP (R138) R-W CLIP (R338)
PAL		0.77 V (110%)	

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
				(3) Next, alternately turn R- and B-W CLIP VRs so that the carrier leakage is minimized.  (4) If the video signal clipping level is not 110% after the above adjustment, repeat steps (2) and (3) to adjust to 110%. (5) After the adjustment is done correctly, reset the sensitivity select switch back to "0 dB".

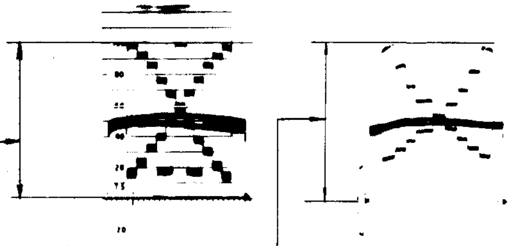
4.21 IRIS ADJUSTMENT

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
1	Iris adjustment	Grey scale chart Oscilloscope		- Set the IRIS switch (NOR/OVER) to NOR (normal). - Connect a 75-ohm termination to VIDEO OUTPUT connector or connect this to a monitor via WFM.

Test Point	Level	VR: PA board
VIDEO OUTPUT	Refer below.	IRIS LEVEL(R51)

JVC grey scale
- NTSC : 100 IRE ±5 IRE (0.714 V ± 40 mV)
- PAL : 100% ± 5% (0.7 V ± 35 mV)

EIA log. grey scale
NTSC : 90 – 100 IRE (0.65 – 0.714 V)



JVC grey scale   EIA grey scale

(1) Set the Iris mode switch on the lens to AUTO.
(2) Adjust the auto iris level to the specified value.
(3) Switch the HI-SENS switch from 0 dB → +9 dB → +18 dB and check that the level is approximately 100%.
(4) Reset the HI-SENS switch back to "0 dB".
(5) Set the IRIS switch to NOR, then to OVER.

IRIS switch		Test Point	Level	VR: PA board
NORMAL	NTSC PAL	VIDEO OUTPUT	0.714 V (100 IRE) 0.7 V (100%)	IRIS LEVEL (R51)
OVER			0.74–0.8 V	None

(6) Reset the HI-SENS switch back to "0 dB".

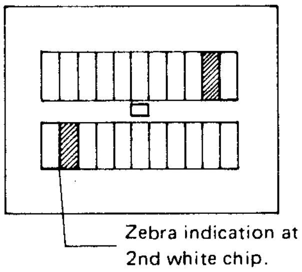
- In normal operation, the auto iris closes when:
  (1) BAR switch ON,
  (2) AUTO BLK ON,
  (3) Camera power STANDBY.

<table>
<tr><th>No.</th><th>Item</th><th>Measuring Instruments</th><th>Measuring Points, Adjusting Levels & Adjusting Points</th><th>Procedures</th></tr>
<tr><td>2</td><td>Video level indicator adjustment</td><td></td><td>
<table>
<tr><th></th><th>Test Point</th><th>Level</th></tr>
<tr><td>NTSC</td><td>VIDEO OUTPUT</td><td>0.714 V</td></tr>
<tr><td>PAL</td><td></td><td>0.7 V</td></tr>
</table>

Viewfinder screen

Note:
Zebra indicating part is between 85 to 95% of nominal video amplitude. Eusure the iris opening to get the specified value at video output with oscilloscope if EIA log. grey scale is used.

RC board
ZEBRA SET (R11)

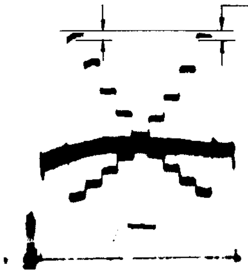
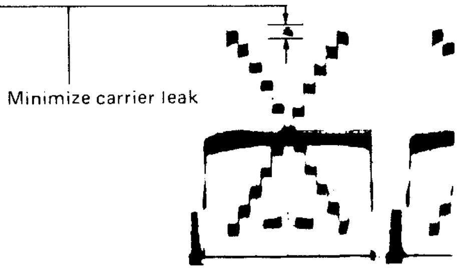
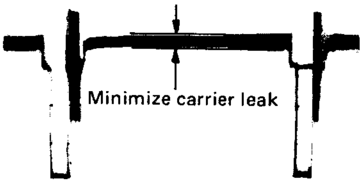
Note:
The RC board is inside the test select section on the back of the camera. Before adjustment, pull out the battery guide base as described in "Disassembly" section 2.1.1 Fuse replacement.
</td><td>
(1) Set the lens iris switch to MANU and adjust the iris manually so that the VIDEO OUTPUT connector is 100%.
(2) Set the TEST OUT SELECT switches to "ENC".
(3) In the VF-215 Viewfinder, check that the stripes are displayed as shown below.
If the correct display is not observed, press the LEVEL INDICATOR switch on the front of the camera in case of the switch off.


Standard display

(4) Adjust ZEBRA SET (R11) so that the stripe pattern is displayed in the second step from the white position.
</td></tr>
</table>

4.22 AUTO WHITE AND AUTO BLACK BALANCE ADJUSTMENTS

Since the auto white balance and auto black balance are related each other, these adjustments should be performed repeatedly.

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
1	Auto white adjustment	Grey scale pattern	VIDEO OUTPUT AT board 4 B-A WHITE (R1) R-A WHITE (R18)  EIA grey scale	(1) Set the filter disc switch to "2" (3200 K). (2) Set the WHITE BAL. switch to AUTO. (3) If the auto iris level is adjusted and operating normally, set the lens switch to AUTO. (4) Adjust the VRs while depressing the AUTO WHITE/AUTO BLACK switch under the camera to the AUTO WHITE side. (5) Adjust the VRs alternately so that the carrier leakage of the white part is minimized.  JVC grey scale
2	Auto black adjustment		AT board 4 B-BLACK (R2) R-BLACK (R14)	(1) Turn the AUTO BLACK switch (S1) on PR board to "ON". (2) Adjust the VRs while depressing the AUTO WHITE/AUTO BLACK switch under the camera to the AUTO BLACK side. (The lens is automatically closed.)  (3) Adjust the VRs alternately so that the carrier leakage of black is minimized.

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

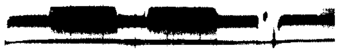
4.23 CONTOUR CORRECTOR ADJUSTMENT

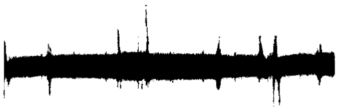
<table>
<tr>
<td>1</td>
<td>V-zero balance adjustment</td>
<td>Grey scale pattern

Oscilloscope (V-rate: 10 : 1)</td>
<td>CC board 3
TP3
V-BAL (R112)</td>
<td>

- Set the WHITE BAL. switch to PRESET.
- Set the HI-SENS switch to "0 dB".
- Take out CC board, attach an extension board and reset.

(1) Set the filter disc switch to "2" (3200 K).
(2) Display the grey scale pattern full-screen, with the lens setting at AUTO IRIS.
(3) Set the CC board CONTOUR switch (S1) to ON.
(4) Turn the CC board V-LEVEL VR (R119) fully clockwise.
(5) Adjust V-BAL VR (R112) so that no video signal leakage is observed.





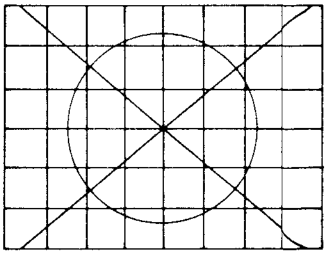
</td>
</tr>
<tr>
<td>2</td>
<td>Noise slice adjustment</td>
<td>Oscilloscope (H-rate: 10 : 1)</td>
<td>CC board 3
TP5
NOISE SLICE (R162)</td>
<td>(1) Turn the CC board H-LEVEL VR (R132) and V-LEVEL VR (R119) to the mechanical center.
(2) Adjust so that the noise level is the half of the maximum value.</td>
</tr>
<tr>
<td>3</td>
<td>Level depend adjustment</td>
<td></td>
<td>VIDEO OUTPUT

CC board
LEVEL DEPEND (R151)</td>
<td>(1) Turn the H-LEVEL VR (R132) fully clockwise.
(2) Adjust LEVEL DEPEND (R151) so that the contour spike of the lowest step of the grey scale pattern disappears.</td>
</tr>
<tr>
<td>4</td>
<td>Contour level adjustment</td>
<td></td>
<td>CC board 3
V-LEVEL (R119)
H-LEVEL (R132)</td>
<td>(1) Standard adjustment is made by setting to the rotation angle shown below.
<table>
<tr><td></td><td>Rotation angle</td></tr>
<tr><td>V-LEVEL (R119)
H-LEVEL (R132)</td><td>a half of rotation
* "</td></tr>
</table>
Note: If contour levels are not insufficient, slightly turn the H- and V-LEVEL VRs clockwise.

*70% modulation depth at 5 MHz if in-mega cycle test chart is used.</td>
</tr>
</table>

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

4.24 AUTO SHIFT ADJUSTMENT

1	Auto shift adjustment	Registration chart B/W monitor	70% video level TEST OUTPUT	- Warm up the camera for 30 minutes, with the filter disc setting at "1" (closed). - Check that the registration adjustment has been performed with the switch on the camera front set to MANUAL, and also verify there is less misregistration. (See 4.13.) - Check that the CC board has been adjusted and it operates normally. - Set the LENS IRIS switch to MANUAL. (1) Take out AT board, attach an extention board and reset. (2) Display the registration pattern to fill the monitor screen, and adjust the lens focus.  (4) Adjust the lens iris so that the PA board TP2 (G ch.) outputs 0.14 Vp-p (or 70 IRE, if a WFM is connected to the VIDEO OUTPUT terminal). (5) Set the VF/TEST OUTPUT SELECT switches to "B-G". (6) When the AUTO SHIFT switch is switched ON, the black image is shifted. Switch on repeatedly and adjust the VRs so that the black and white images are superimposed on the center.
			AT board $\boxed{4}$ B-V SHIFT (R20) ⟶ B-H SHIFT (R19) ⟶	Vertical direction Horizontal direction
				(7) Set the VF/TEST OUTPUT SELECT switches to "R-G". (8) The black image is shifted when the AUTO SHIFT switch is switched ON. Switch on repeatedly and adjust the VRs so that the black and white images are superimposed on the center.
			AT board $\boxed{4}$ R-V SHIFT (R22) ⟶ R-H SHIFT (R23) ⟶	Vertical direction Horizontal direction

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures

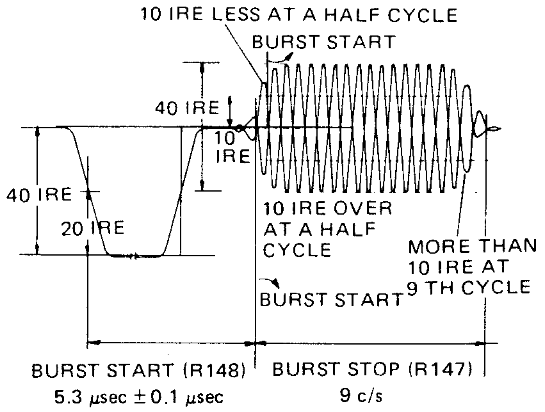
4.25 SSG ADJUSTMENT (NTSC)

No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
				● Warm up the camera for more than 15 minutes, with the filter disc switch set to "1" (closed). ● The frequency counter is: 1) The 8 digits or more display is preferable. 2) Required of an accuracy of more than 0.1 ppm, or 1 x 10^{-7}, at 0°C to 40°C. ● Set the SE board C-BARS switch (S3) to FULL. ● Do not touch INT SC PHASE COARSE (S4) and FINE (R60).
1	SC frequency adjustment	Frequency counter	SE board [5]	(1) Take out SE board, attach an extention board and reset. (2) Connect a frequency counter to and adjust the trimmer capacitor.

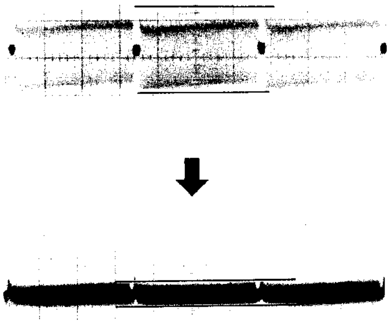
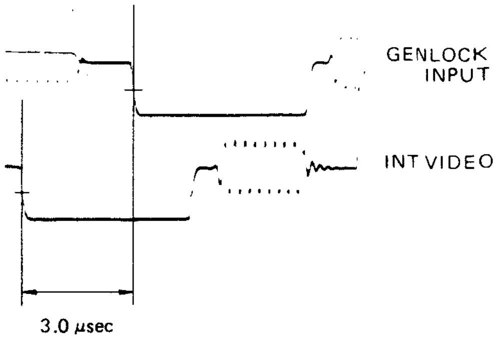
	Signal	Test Point	SE board
SC Frequency	3.579545 MHz	SE board [5] TP1	SC FREQ. C3
SC Output	Maximum Amplitude		SC Trans. T1

2	Burst position and pulse width adjustment	Oscilloscope	VIDEO OUTPUT	(1) Connect an oscilloscope to VIDEO OUTPUT connector. (2) Magnify the H-sync and burst portion. (3) Adjust as follows:

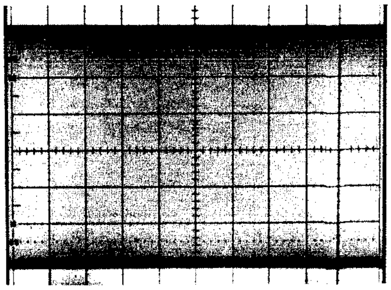
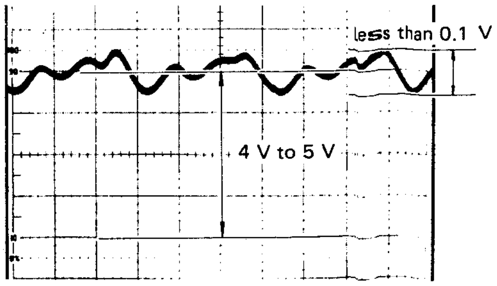
Test Point	VR
VIDEO OUTPUT	BURST START (R148)
	BURST STOP (R147)


10 IRE LESS AT A HALF CYCLE
BURST START
40 IRE
10 IRE
40 IRE
20 IRE
10 IRE OVER AT A HALF CYCLE
MORE THAN 10 IRE AT 9 TH CYCLE
BURST START
BURST START (R148)
5.3 μsec ± 0.1 μsec
BURST STOP (R147)
9 c/s

3	SC LOCK adjustment	Digital voltmeter Oscilloscope (V-rate: 10 : 1)	SE board [5] TP7 SC LOCK (R73)	(1) Apply composite video or black burst signal from a sync pulse generator to the GENLOCK INPUT terminal of the camera. (2) Connect an oscilloscope to SE board TP7. (3) Adjust R73 to be symmetrical waveform at upper and lower sides as shown.

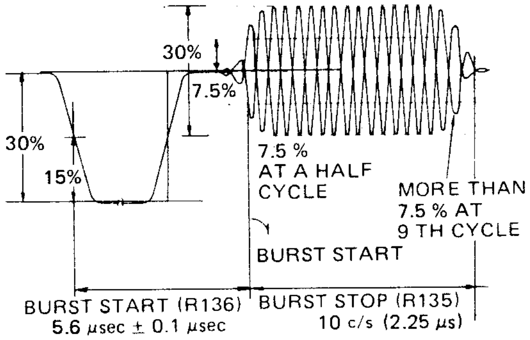
No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
3		Oscilloscope (V-rate: 10 : 1)		 (4) Set the vectorscope, if used, to EXT. LOCK, and adjust SC LOCK (R73) so that the jitter is minimized.
4	H. AFC adjustment	Digital voltmeter	SE board $\boxed{5}$ TP2 H. AFC (C13)	. . .+5 V ± 0.2 V
5	H PHASE adjustment	Oscilloscope (H-rate: 10 : 1)	GENLOCK INPUT VIDEO OUTPUT SE baord $\boxed{5}$ H-PHASE (R28)	(1) Apply composite video or black burst signal from a sync pulse generator to the GENLOCK INPUT terminal of the camera. (2) Connect A channel of a dual-trace oscilloscope to GENLOCK input. (3) Connect the other B input channel of the oscilloscope to VIDEO OUTPUT. (4) Observe the two inputs simultaneously on the oscilloscope and compare their phases. (5) Adjust the SE board H-PHASE (R28) so that the internal video (VIDEO OUTPUT) sync is coincide to external video sync (GENLOCK INPUT). 

4.25-P SSG ADJUSTMENT (PAL)

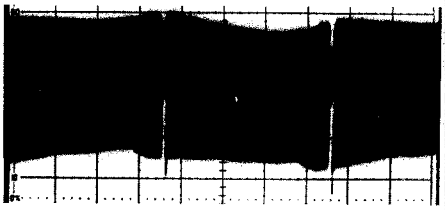
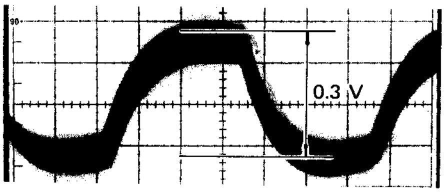
No.	Item	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
				● Warm up the camera for more than 15 minutes, with the filter disc switch set to "1" (closed). ● The frequency counter is: 1) The 8 digits or more display is preferable. 2) Required of an accuracy of more than 0.1 ppm, or 1 x 10^{-7}, at 0°C to 40°C. ● Do not touch INT SC PHASE COARSE (S1) and FINE (R17) if provided.
1	SC frequency adjustment	Frequency counter	SE board 5	(1) Take out SE board 5 , attach an extention board and reset. (2) Connect a frequency counter to TP3 and adjust the trimmer capacitor and trans.
2	Internal fsc-25Hz lock adjustment	Oscilloscope	SE board 5 fsc-25 Hz (T2) 282 fh LOCK (C60)	(1) Connect an oscilloscope to TP5 with H-rate time division. (2) Adjust core of transformer (T2) so that maximum output amplitude.  H-rate (3) Connect an oscilloscope to TP4 with V-rate time division. (4) Adjust trimmer capacitor (C60) so that averaged DC level of waveform is 4 V to 5 V and minimum ripple are observed.  V-rate

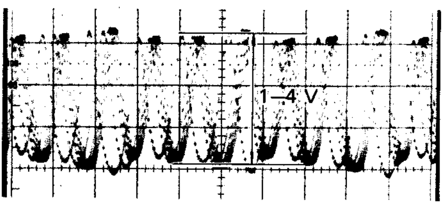
	Signal	Test Point	SE board
SC Frequency	4.433619 MHz	SE board 5	SC FREQ. C57
SC Output	Maximum Amplitude	TP3	SC Trans. T1

Test Point	Adjustment	
TP5	fsc-25 Hz (T2) Transformer	Maximum Output (3 Vp-p or more)
TP4	CK FREQ (C60) Trimmer capacifor	Ripple : Less than 0.1 V Average DC : 4 to 5 V

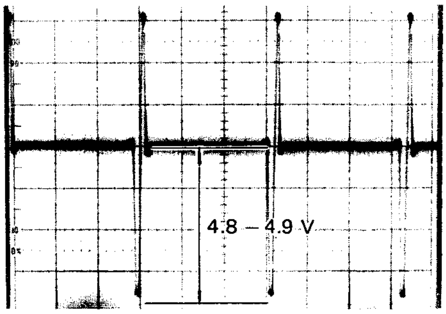
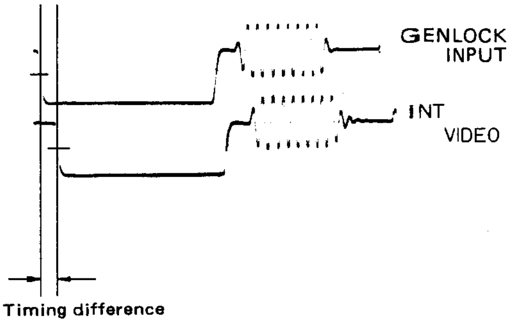
<table>
<tr><th>No.</th><th>Items</th><th>Measuring Instruments</th><th>Measuring Points, Adjusting Levels & Adjusting Points</th><th>Procedures</th></tr>
<tr><td>3</td><td>Burst position and pulse width adjustment</td><td>Oscilloscope</td><td>VIDEO OUTPUT
SE BOARD $\boxed{5}$
<table><tr><th>Test Point</th><th>VR</th></tr><tr><td>VIDEO OUTPUT
(75-ohm Terminated)</td><td>BURST START (R179)
BURST STOP (R178)</td></tr></table></td><td>(1) Connect an oscilloscope to VIDEO OUTPUT with a 75 ohm termination plug.
(2) Magnify the H-sync and burst portion.
(3) Adjust as follows:


30%
7.5%
30%
15%
7.5 % AT A HALF CYCLE
MORE THAN 7.5 % AT 9 TH CYCLE
BURST START
BURST START (R136) 5.6 μsec ± 0.1 μsec
BURST STOP (R135) 10 c/s (2.25 μs)

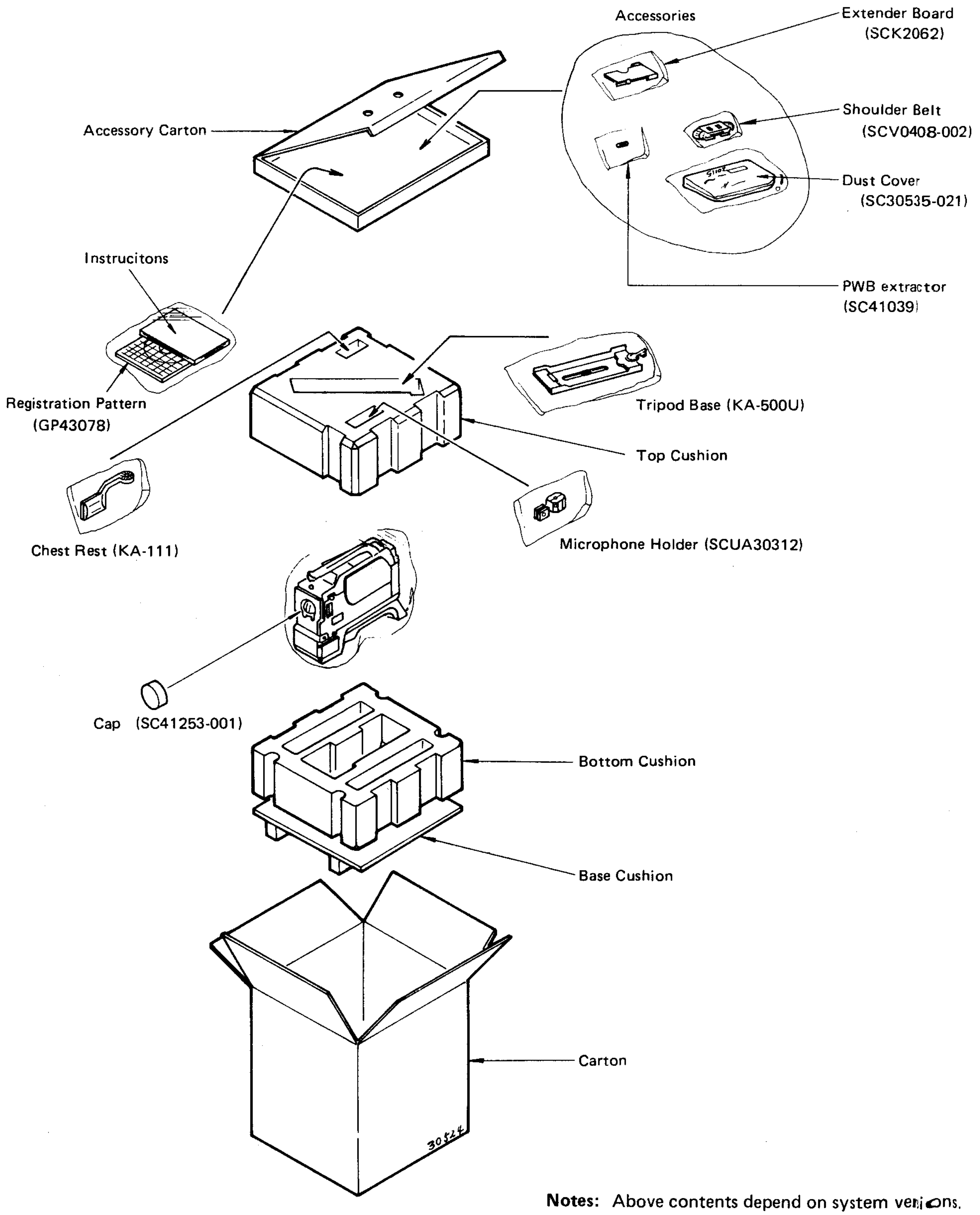
</td></tr>
<tr><td>4</td><td>SC LOCK adjustment</td><td>Digital voltmeter
Oscilloscope
(V-rate: 10 : 1)</td><td>SE board $\boxed{5}$
TP1 : 4 V
SC LOCK (R51)</td><td>(1) Apply composite video or black burst signal from a sync pulse generator to the GENLOCK INPUT terminal of the camera.
(2) Connect an oscilloscope to SE board $\boxed{5}$ TP1.
(3) Adjust R51 to be symmetrical waveform at upper and lower sides as shown A and B.
(A) GOOD V-rate

(B) GOOD H-rate


NO-GOOD


(4) Set the vectorscope, if used, to EXT LOCK, and adjust SC LOCK (R51) so that the jitter is minimized.</td></tr>
</table>

No.	Items	Measuring Instruments	Measuring Points, Adjusting Levels & Adjusting Points	Procedures
5	H-LOCK adjustment	Oscilloscope (H-rate: 10 : 1)	SE board 5 H-LOCK (C60) TP4	(1) Apply composite video or black burst signal from a sync pulse generator to the GENLOCK INPUT terminal of the camera. (2) Connect an oscilloscope to TP4 of SE board. (3) Adjust H-LOCK (C60) trimmer core so that the TP4 DC level (average) is 4.8 – 4.9 V. 
6	H-PHASE adjustment	Oscilloscope (H-rate: 10 : 1)	GENLOCK INPUT VIDEO OUTPUT SE board 5 H-PHASE (R33)	(1) Apply composite video or black burst signal from a sync pulse generator to the GENLOCK INPUT terminal of the camera. (2) Connect A channel of a dual-trace oscilloscope to GENLOCK INPUT. (3) Connect the other B input channel of the oscilloscope to VIDEO OUTPUT. (4) Observe the two inputs simultaneously on hte oscilloscope and compare their phases. (5) Adjust the SE board H-PHASE (R33) so that the internal video (VIDEO OUTPUT) sync is coincide to external video sync (GENLOCK INPUT). 

SECTION 5
REPACKING


Accessories
Extender Board (SCK2062)
Accessory Carton
Shoulder Belt (SCV0408-002)
Dust Cover (SC30535-021)
PWB extractor (SC41039)
Instrucitons
Registration Pattern (GP43078)
Tripod Base (KA-500U)
Top Cushion
Chest Rest (KA-111)
Microphone Holder (SCUA30312)
Cap (SC41253-001)
Bottom Cushion
Base Cushion
Carton
30524

Notes: Above contents depend on system versions.

SECTION 6
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety.
Replace only with specified part numbers.

CONTENTS

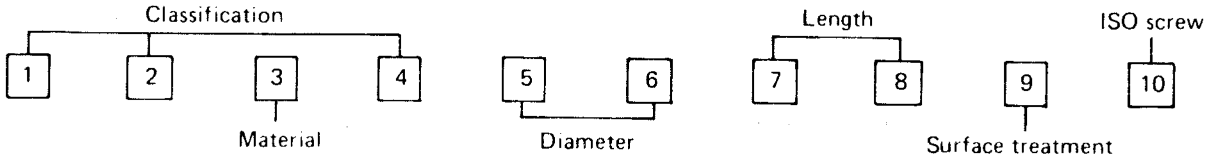
Page
6.1 STANDARD PART NUMBER CODING .... 6 - 2
  6.1.1 Screw coding .... 6 - 2

6.2 EXPLODED VIEWS AND PARTS LIST .... 6 - 3
  6.2.1 Optical block assembly .... 6 - 3
  6.2.2 Body assembly .... 6 - 4
  6.2.3 Microphone holder assembly .... 6 - 6

Note: Chest rest (model KA-111), Tripod base (model KA-500) and Microphone holder are common with KY-950/900/310 series three tube color video camera accessory (or optional).

6.1 STANDARD PART NUMBER CODING

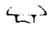
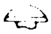
6.1.1 Screw coding



Classification (first digit)

Symbol Letter	Name
S	Normal screw
N	Assembly screw
L	"
D	"
M	Wood screw
F	Feather screw
T	Set screw
Y	"
B	Bolt
N	Nut
W	Washer
R	E-ring
E	Eyelet
P	Spring
G	Washer head screw

Shape of Screw Head (second digit)

Symbol Letter		Shape of Screw Head
P		Pan head
S		Flat countersunk head
H		Oval countersunk head
D		Binding head
R		Round head
B		Round head
T		Truss head

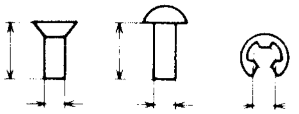
Material (third digit)

Symbol Letter	Material
S	Steel
E	Stainless steel
C	Cast iron
U	Bronze
B	Brass
P	Phosphor bronze
N	German silver
Y	Brass
A	Aluminum
Z	Zinc alloy
K	Polycarbonate

Type of Screw (fourth digit)

Symbol Letter	Type of Screw
P	Cross-Recessed head screw
A	Tapping screw
B	Special tapping screw
T	Thread rolling tapping screw
E	Special tapping screw
F	Special tapping screw

Diameter and Length of Screw (fifth – eighth digit)



– Example –

S P B P 3 0 0 6 Z S

(Diameter x 10) (Length)

Diameter : 3 mm

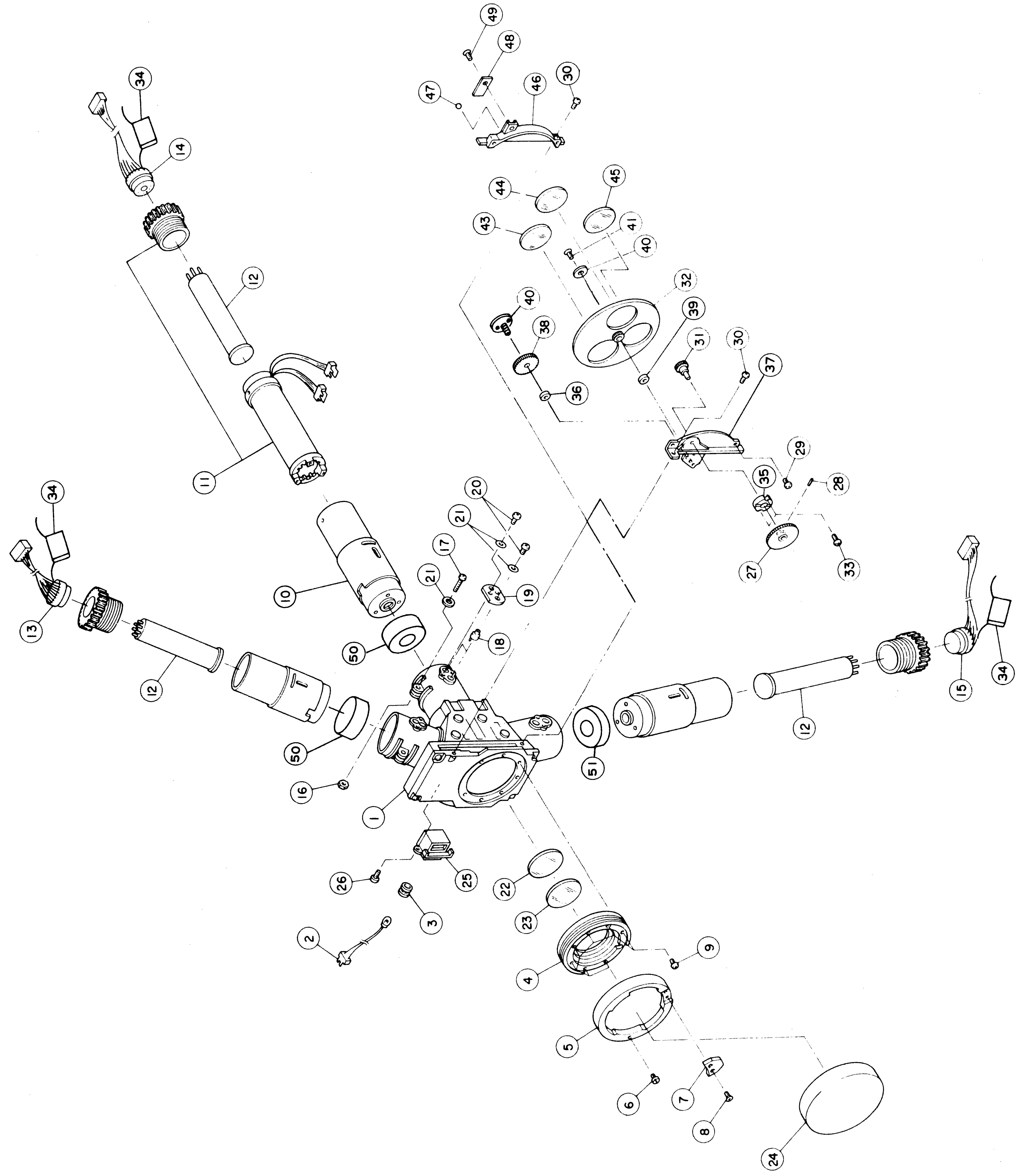
Length : 6 mm

Surface Treatment (ninth digit)

Symbol Letter	Surface Treatment
Z	Galvanization, dichromic acid treatment (MFZn2-C)
N	Nickel plating (MFNi2, MFNil)
R	Chrome plating (MBCr2, MBCr1)
G	Silver plating (SP4)
W	Nichrome platings
P	Phosphite treatment
B	Bronze plating
M	Black coloring after galvanization
A	Red coloring after galvanization
C	Blue coloring after galvanization
T	Green coloring after galvanization
V	Violet coloring after galvanization
F	Iron with black coloring

6.2 EXPLODED VIEWS AND PARTS LIST

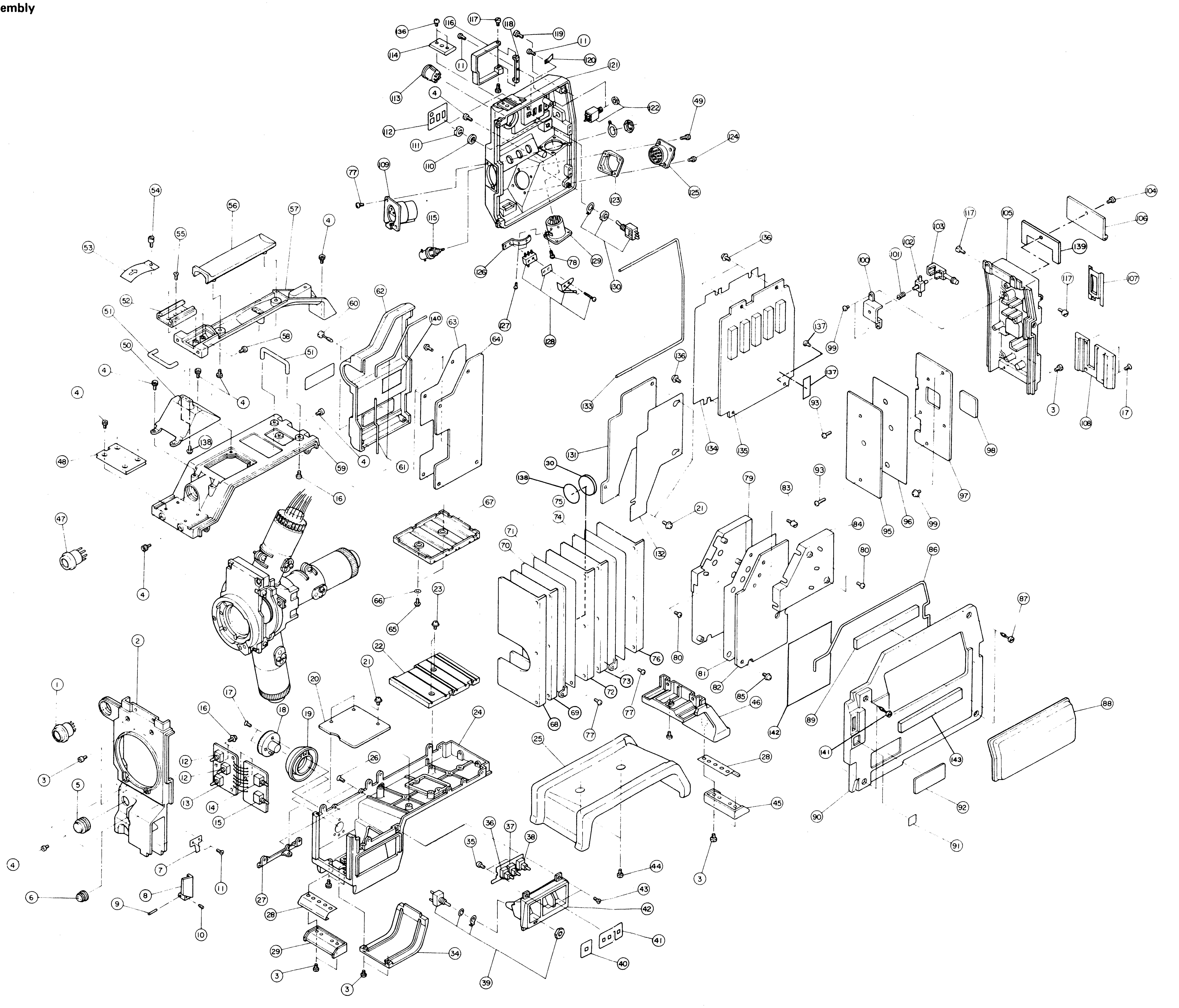
6.2.1 Optical block assembly



Optical block assembly list

Symbol No.	Part No.	Part Name	Description
1	Not Available	K23 Prism Ass'y	UA30307
2	SCV0455-001	Bias Light Ass'y	
3	SC40938-001	Bushing	
4	SC30343-001	Mount Base	Replace with ⑤ together for replacement purpose
5	SC40788-001	Mount Ring	Replace with ⑥ together for replacement purpose
6	SC40779-001	Screw	
7	SC40794-001	Lever	
8	SSSP2604M	Screw	M2.6 x 4
9	SPSP3008N	″	M3 x 8
10	SC30384-001	Yoke Case	R, G and B Alternative
11	SCV0401-012	Deflection Coil Ass'y	″
⚠ 12	H4101	Saticon Tube	″
⚠ 13	SCV0496-003	Take Socket Ass'y	for B-CH (㉞ My capacitor included)
⚠ 14	″ -002	″	for G-CH
⚠ 15	″ -001	″	for R-CH
16	NNB3000N	Nut	M3
17	SPBX3012N	Screw	M3 x 12
18	SC41511-001	Adjust Pin	
19	SC40860-001	Adjust Plate	
20	SPSB3004N	Screw	M3 x 4
21	WNB3000N	Washer	
22	SC40993-001	Stopper Ring	
23	SC40881-002	Quartz Filter	
24	SC41253-001	Front Cap	
25	SCUA30308-001	Lamp Housing	
26	SPSP2004N	Screw	M2 x 4
27	SC41486-001	Knob	
28	TRS2002N	Screw	M2 x 2
29	SDSP2006	″	M2 x 6
30	SDSP2606M	″	M2.6 x 6
31	SC41482-001	Gear	
32	SC30539-001	Filter Wheel	
33	SPSK2050M	Screw	M2 x 5
⚠ 34	SCV0385-223	My Capacitor	0.022/1 kV
35	SC41649-001	Spacer	
36	SC41489-002	″	
37	SC30538-001	Filter Cover	
38	SC41484-001	Gear	
39	SC41489-001	Spacer	
40	SC41677-001	Screw	
41	SSSP2004N	″	M2 x 4
42	—	—	
43	SC41438-001	Filter	3200 K
44	SC41440-001	″	5600 K + 25% ND
45	SC41439-001	″	5600 K
46	SC30537-001	Filter Cover	
47	SC40465-030	Steel Ball	
48	SC41488-001	Spring	
49	SSSP3004N	Screw	M2 x 4
50	SC41973-001	Shield Cap	for B and G CH
51	SC41973-002	″	for R CH

6.2.2 Body assembly



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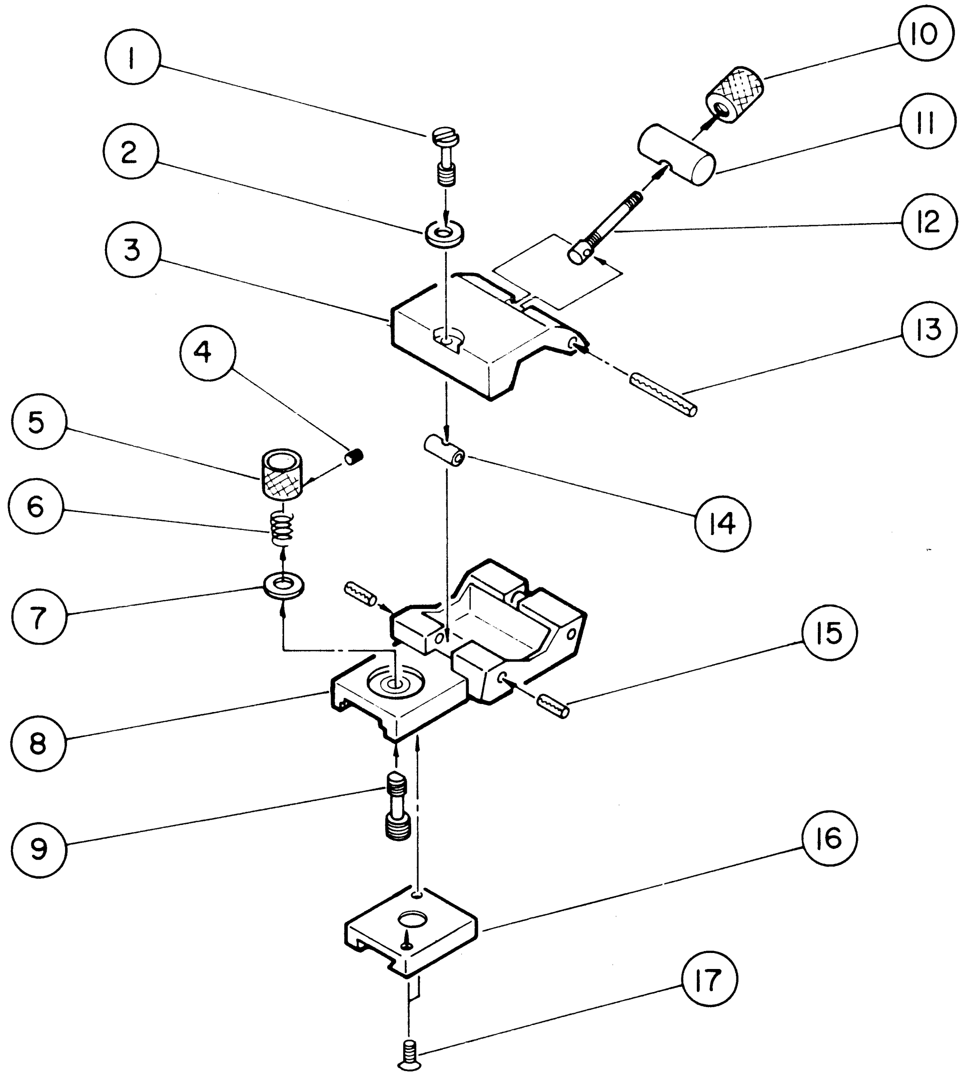
6-4

Body assembly list

Symbol No.	Part No.	Part Name	Description
⚠ 1	SCV0238-08S	Lens Connector	LENS 8 P
2	SC20123-001	Front Frame	
3	BYS3008M	Screw	M3 x 8
4	BYS3005M	"	M3 x 6
5	SC41034-001	Knob	
6	SC41214-002	"	
7	SC41450-001	Spring	
8	SC41449-001	Cover	
9	SC40816-041	Shaft	
10	REE2000	E-Washer	
11	SPSK2025M	Screw	M2 x 2.5
12	SCV0469-001	Switch	VTR, LEVEL IND
13	SCV0516-A18JB2	"	AUTO-WHITE/BLACK
14	" -A2SJH	"	AUTO-SHIFT
15	" -A22JH	"	BARS
16	LPSP2606Z	Screw	M2.6 x 6
17	SSSP3006M	"	M3 x 6
18	SC40928-001	Lock Gear	
19	SC40796-001	Gear Cover	
⚠ 20	Not Available	MT-2 Board	3047
21	DPSP3006Z	Screw	M3 x 6
22	SC30471-001	Bottom Rail	
23	SDSP3006Z	Screw	M3 x 6
24	SC10033-001	Bottom Frame	
25	SC20141-001	Shoulder Pad	
26	SSSP2604M	Screw	M2.6 x 4
27	SC41213-001	Bracket	
28	SC40956-001	Plate	
29	SC30372-001	Base	
⚠ 30	—	—	
31	—	—	
32	—	—	
33	—	—	
34	SC30473-001	Cover	
35	DPSP2606Z	Screw	M2.6 x 6
36	SCV0516-A13HB2	Switch	HI-SENS
37	SCV0339-002	"	WHITE BAL
38	SCV0337-002	"	IRIS
⚠ 39	SCV0661-001	"	OPERATE
40	SC41211-001	Switch Plate	
41	SC41212-001	Switch Cover	
42	SC30474-001	Cover	
43	SSSP3005M	Screw	M3 x 5
44	SDSP4008M	"	M4 x 8
45	SC30372-001	Base	
46	SC20168-001	Foot Base	
⚠ 47	SCV0238-06S	Connector	
48	SC41469-001	VF Bracket	
49	SPSP2612N	Screw	M2.6 x 12
50	SC30478-001	Top Cover	
51	SC40759-002	Guide	
52	SC40886-001	Bracket	
53	C40936	Spring	
54	C40970	Screw	
55	SSSP3006N	"	M3 x 6
56	SC30477-001	Cover	
57	SC20170-001	Handle	
58	SDSP2606M	Screw	M2.6 x 6
59	SC20122-001	Top Frame	
60	SC41220-005	Screw	
61	SC30481-002	Rubber	
62	SC20125-00B	Side Cover	
63	SC41684-001	Sheet	
⚠ 64	Not Available	DF Board	205 P
65	SPSP2604Z	Screw	M2.6 x 4
66	Q03091-138	Washer	
67	SC30472-001	Upper Rail	
68	SC30591-011	PS board Panel	2054
69	" -021	PR board Panel	2055
70	SC41471-002	Plate	
⚠ 71	SC41472-002	Insulator	
72	SC30591-031	CC board Panel	2056
73	" -043	AT board Panel	2057
74	SC41471-001	Plate	
⚠ 75	SC41472-001	Insulator	
76	SC30591-053	SE board Panel (NTSC)	2058 -054 (PAL)
77	SPSP2604N	Screw	M2.6 x 4
78	SPSP2606N	"	M2.6 x 6
79	SC30479-001	Plate	
80	SPBP3006B	Screw	M3 x 6B]
⚠ 81	SC41647-001	Insulator	
82	Not Available	PA Board	2059
83	SC40760-031	Stud	
84	SC40380-001	PA Cover	
85	DPBP3010N	Screw	M3 x 10
86	SC30481-003	Rubber	
87	SC41220-003	Screw	
88	SC30482-001	Pad	
89	SC40162-001	Cushion	
90	SC20126-00B	Side Cover	
91	SC40899-002	Mark	
92	SC41225-002	JVC Logo Mark	
93	SPSP3012R	Screw	M3 x 12
94	DPSP3012Z	"	M3 x 12
95	SC41456-001	Plate	
⚠ 96	SC41457-001	Insulator	
97	Not Available	RC Board	
⚠ 98	SC40597-004	MICA Insulator	
99	LPSP3006Z	Screw	M3 x 6
100	SC41229-001	Bracket	
101	SC41230-001	Spring	
102	SC41228-001	Stopper	
103	SC41227-001	Knob	
104	SC40883-001	Screw	
105	SC20124-001	Rear Frame	
106	SC40773-001	Guide	
107	SC41455-001	Spring	
108	SC40776-003	Slide Base	
109	SCV0316-03P	Connector	MIC 3 PIN
110	SC40618-001	Spacer	
111	SC40916-002	Nut	
112	SC41221-001	Panel	
113	SCV0238-06S	Connector	MIC 6 PIN
114	SC30374-031	Bracket	
115	SCV0178-001	BNC Connector	VIDEO, TEST, GENLOCK
116	SC41222-001	SW Cover	
117	SC41033-001	Screw	
118	SC41223-001	Base	
119	BYS3015M	Screw	M3 x 15
120	SC40797-001	Spring	
121	SC20127-001	Cover	
122	QMS3501-013	Jack	EARPHONE
123	SC41547-001	Bracket	
124	SPSP2608N	Screw	M2.6 x 8
⚠ 125	SCV0230-00P	C. Connector	
126	SC40752-003	Bracket	
127	SPBP2003N	Screw	M2 x 3
128	SCV0399-001	Actuater	
⚠ 129	SCV0462-04P	XLR Connector	4 PIN
⚠ 130	SCV0052-001	Switch	POWER
⚠ 131	Not Available	CT Board	2060
⚠ 132	SC41478-001	Insulator	
133	SC30481-001	Packing	
⚠ 134	SC41224-001	Insulator	
⚠ 135	Not Available	MT-1 Board	1216
136	SDSP3006M	Screw	M3 x 6
⚠ 137	SC42023-001	Sheet	
138	SC42022-001	"	

Symbol No.	Part No.	Part Name	Description
136	SDSP3006M	Screw	M3 x 6
137	SDSP2606R	"	M2.6 x 6
138	SPSP3012N	"	M3 x 12
139	SC40897-002	Rubber	Glued to 105
140	SC41732-001	VR Location Label	for DEF BOARD
141	SC41220-004	Screw	
142	SC41731-001	VR Location Label	for PA BOARD
143	SC41226-001	Cushion	

6.2.3 Microphone holder assembly



Microphone holder assembly list

Symbol No.	Part No.	Part Name	Description
1	SC41005-001	Screw	
2	SC40297-041	Spacer	
3	SC30397-001	Upper Holder	
4	YFS2604	Set Screw	M2.6 x 4
5	SC41007-001	Knob	
6	SC41008-001	Spring	
7	SC40297-051	Spacer	
8	SC30398-001	Lower Holder	
9	SC41009-001	Screw	
10	SC41004-001	Nut	
11	GC44933-001	Pin	
12	SC41006-001	Bolt	
13	PRE3028	Spring Pin	3 x 28
14	GC44936-001	Nut	
15	PRE3016	Spring Pin	3 x 16
16	SC30373-031	Holder	
17	SSSP3006M	Screw	M3 x 6B

: UA30312

SECTION 7
CHARTS AND DIAGRAMS

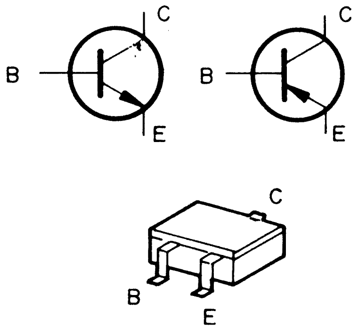
7.1 SCHEMATIC DIAGRAM NOTES

7.1.1 Schematic safety precaution

parts are safety related parts.
When replacing them, be sure to use the specified parts.

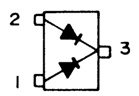
Voltage and waveform measurements.
Voltage: Measured with digital voltmeter in DC range; iris closed.
Waveform: Grey scale illuminated at more than 4000 lux at 3200 K lighting.

Chip transistor

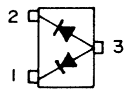


Chip diode

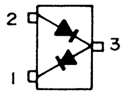
MA152WK



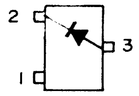
MA152WA

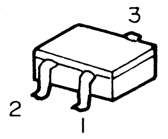


MA153

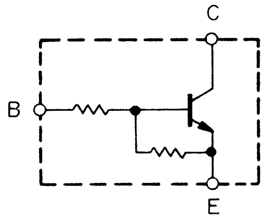


MA152A

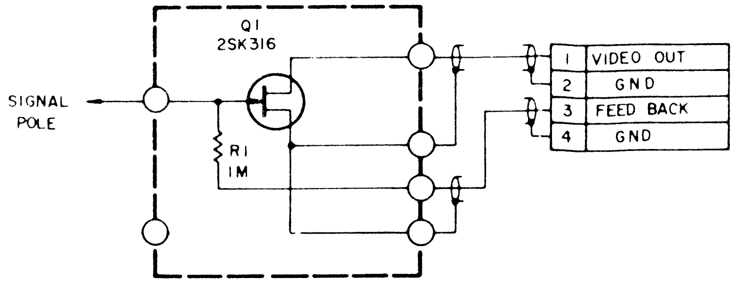




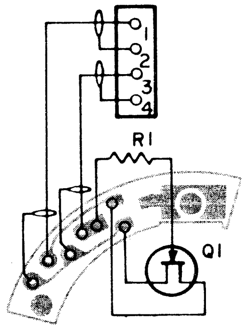
DTC124K



7.2 HEAD PA BOARD SCHEMATIC DIAGRAM
(Circuit construction is the same in R, G and B ch.)

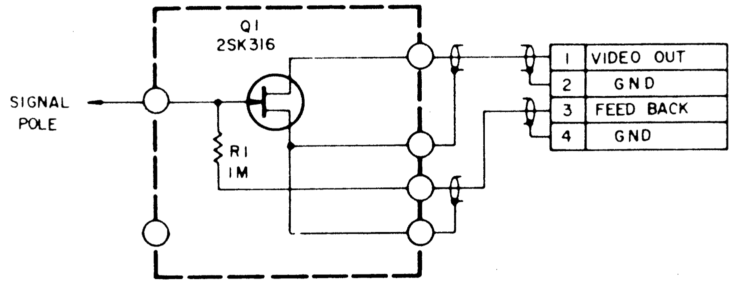

Q1
2SK316
SIGNAL
POLE
R1
1M
1 VIDEO OUT
2 GND
3 FEED BACK
4 GND

7.3 HEAD PA CIRCUIT BOARD
(Circuit construction is the same in R, G and B ch.)



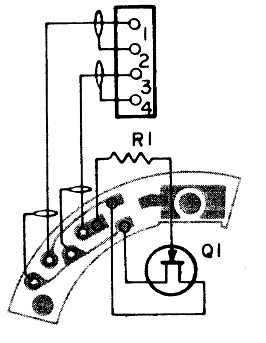
7.2 HEAD PA BOARD SCHEMATIC DIAGRAM

(Circuit construction is the same in R, G and B ch.)

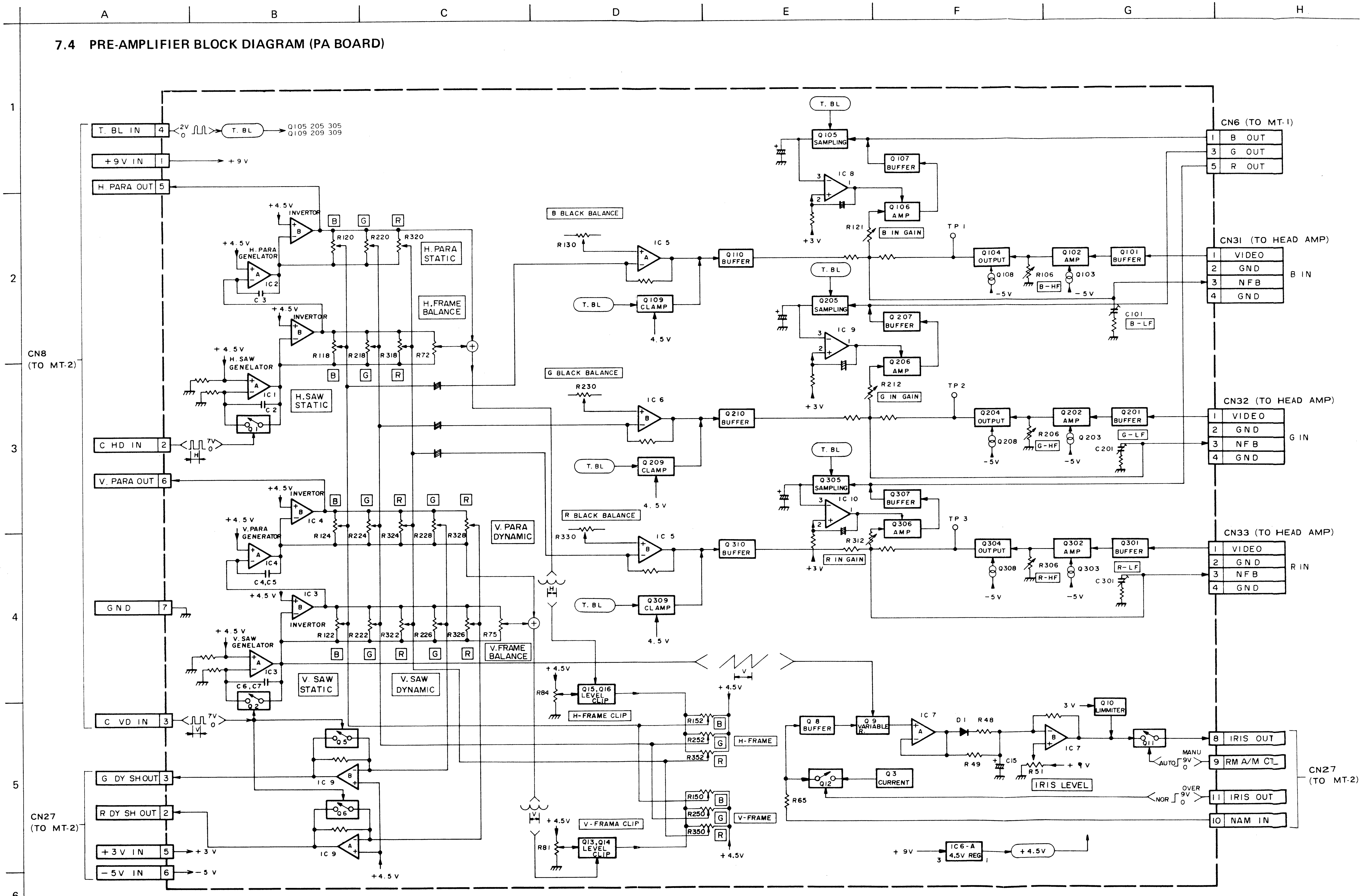

Q1
2SK316
SIGNAL POLE
R1
1M
1 VIDEO OUT
2 GND
3 FEED BACK
4 GND

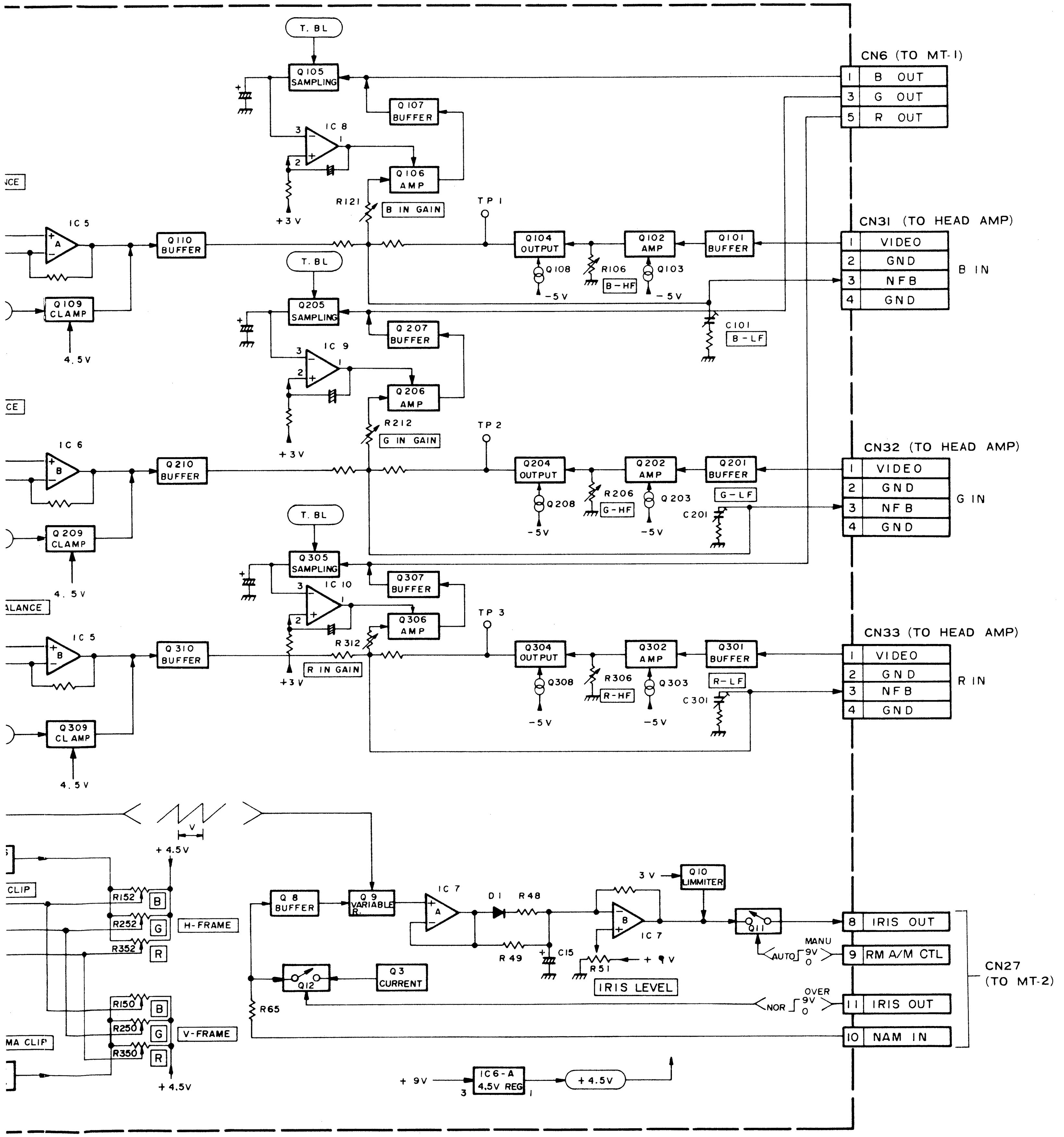
7.3 HEAD PA CIRCUIT BOARD

(Circuit construction is the same in R, G and B ch.)

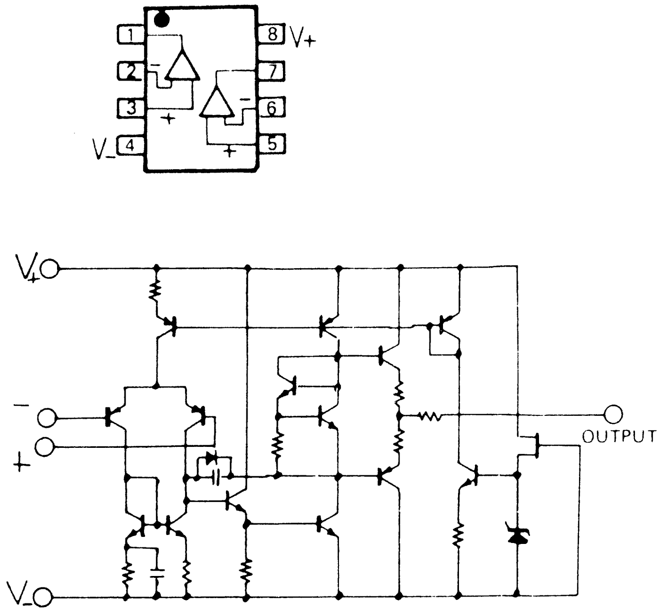


7.4 PRE-AMPLIFIER BLOCK DIAGRAM (PA BOARD)

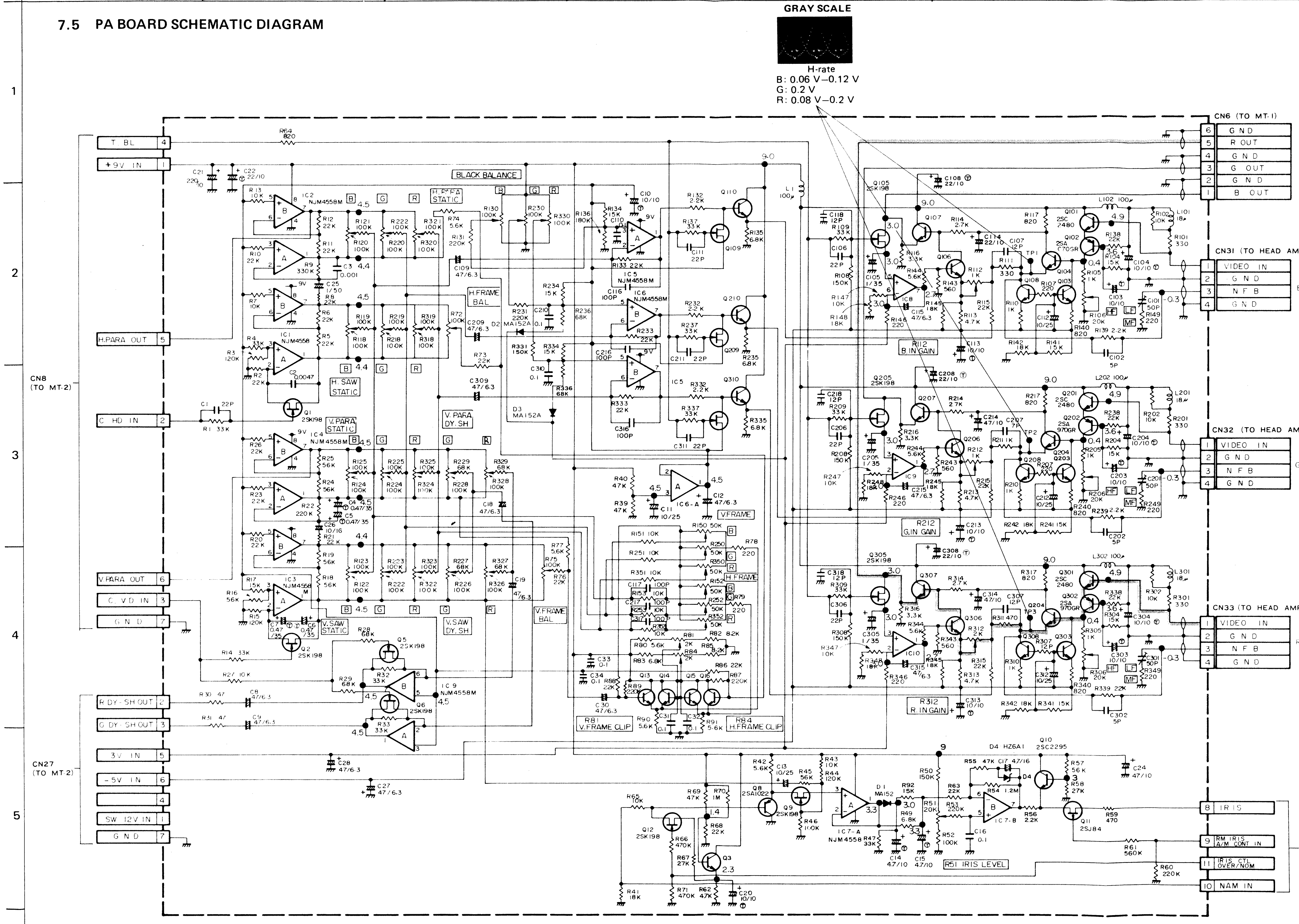

A
B
C
D
E
F
G
H
1
2
3
4
5
6
CN8
(TO MT-2)
T. BL IN 4
+9V IN 1
H. PARA OUT 5
C HD IN 2
V. PARA OUT 6
GND 7
C VD IN 3
CN27
(TO MT-2)
G DY SHOUT 3
R DY SH OUT 2
+3V IN 5
−5V IN 6
T. BL
Q105 205 305
Q109 209 309
+9V
+3V
−5V
+4.5V
INVERTOR
H. PARA GENERATOR
IC2
C3
H. SAW GENERATOR
IC1
C2
Q1
H. SAW STATIC
H. PARA STATIC
H. FRAME BALANCE
R120
R220
R320
R118
R218
R318
R72
B
G
R
V. PARA GENERATOR
IC4
C4, C5
R124
R224
R324
R228
R328
V. PARA DYNAMIC
IC3
R122
R222
R322
R226
R326
R75
V. FRAME BALANCE
V. SAW GENERATOR
C6, C7
Q2
V. SAW STATIC
V. SAW DYNAMIC
Q5
Q6
IC9
B BLACK BALANCE
R130
IC5
Q110 BUFFER
Q109 CLAMP
4.5V
G BLACK BALANCE
R230
IC6
Q210 BUFFER
Q209 CLAMP
R BLACK BALANCE
R330
Q310 BUFFER
Q309 CLAMP
R84
Q15, Q16 LEVEL CLIP
H-FRAME CLIP
R81
Q13, Q14 LEVEL CLIP
V-FRAMA CLIP
R152
R252
R352
H-FRAME
R150
R250
R350
V-FRAME
Q105 SAMPLING
IC8
Q107 BUFFER
Q106 AMP
R121
B IN GAIN
TP1
Q104 OUTPUT
Q108
R106
B-HF
Q102 AMP
Q103
Q101 BUFFER
C101
B-LF
Q205 SAMPLING
IC9
Q207 BUFFER
Q206 AMP
R212
G IN GAIN
TP2
Q204 OUTPUT
Q208
R206
G-HF
Q202 AMP
Q203
Q201 BUFFER
G-LF
C201
Q305 SAMPLING
IC10
Q307 BUFFER
Q306 AMP
R312
R IN GAIN
TP3
Q304 OUTPUT
Q308
R306
R-HF
Q302 AMP
Q303
Q301 BUFFER
R-LF
C301
CN6 (TO MT-1)
1 B OUT
3 G OUT
5 R OUT
CN31 (TO HEAD AMP)
1 VIDEO
2 GND
3 NFB
4 GND
B IN
CN32 (TO HEAD AMP)
G IN
CN33 (TO HEAD AMP)
R IN
Q8 BUFFER
Q9 VARIABLE R
IC7
D1
R48
R49
C15
R51
IRIS LEVEL
3V
Q10 LIMMITER
Q11
Q12
Q3 CURRENT
R65
MANU
AUTO
OVER
NOR
8 IRIS OUT
9 RM A/M CT
11 IRIS OUT
10 NAM IN
CN27
(TO MT-2)
+9V
IC6-A 4.5V REG
+4.5V
2V
7V
0
H
V


T. BL
Q105 SAMPLING
Q107 BUFFER
IC 8
Q106 AMP
+3 V
R121
B IN GAIN
TP 1
IC 5
A
Q110 BUFFER
Q104 OUTPUT
Q102 AMP
Q101 BUFFER
Q108
R106
B-HF
Q103
-5 V
Q109 CLAMP
4.5 V
Q205 SAMPLING
Q207 BUFFER
IC 9
Q206 AMP
R212
G IN GAIN
TP 2
C101
B-LF
IC 6
B
Q210 BUFFER
Q204 OUTPUT
Q202 AMP
Q201 BUFFER
Q208
R206
G-HF
Q203
G-LF
C201
Q209 CLAMP
Q305 SAMPLING
Q307 BUFFER
IC 10
Q306 AMP
TP 3
R312
R IN GAIN
Q310 BUFFER
Q304 OUTPUT
Q302 AMP
Q301 BUFFER
Q308
R306
R-HF
Q303
R-LF
C301
Q309 CLAMP
CN6 (TO MT-1)
1 B OUT
3 G OUT
5 R OUT
CN31 (TO HEAD AMP)
1 VIDEO
2 GND
3 NFB
4 GND
B IN
CN32 (TO HEAD AMP)
1 VIDEO
2 GND
3 NFB
4 GND
G IN
CN33 (TO HEAD AMP)
1 VIDEO
2 GND
3 NFB
4 GND
R IN
NCE
CE
ALANCE
V
+4.5V
CLIP
R152 B
R252 G
H-FRAME
R352 R
R150 B
R250 G
V-FRAME
R350 R
MA CLIP
Q 8 BUFFER
Q 9 VARIABLE R
IC 7
A
D1
R48
R49
C15
3 V
Q10 LIMMITER
B
R51
+9V
IRIS LEVEL
Q11
MANU 9V 0 AUTO
Q12
Q3 CURRENT
OVER 9V 0 NOR
R65
8 IRIS OUT
9 RM A/M CTL
11 IRIS OUT
10 NAM IN
CN27 (TO MT-2)
+9V
3 IC6-A 4.5V REG 1
+4.5V

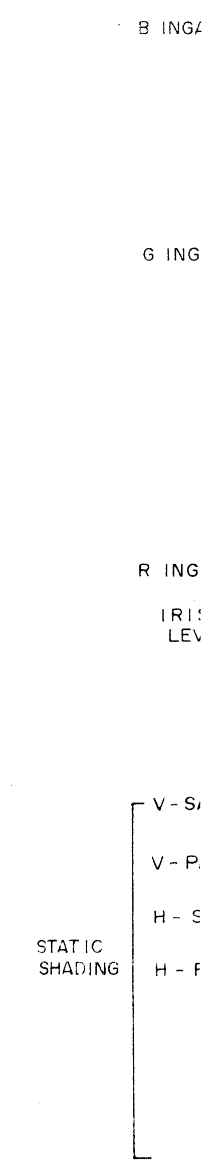
NJM4558M (Dual Op. Amp) [JRC]

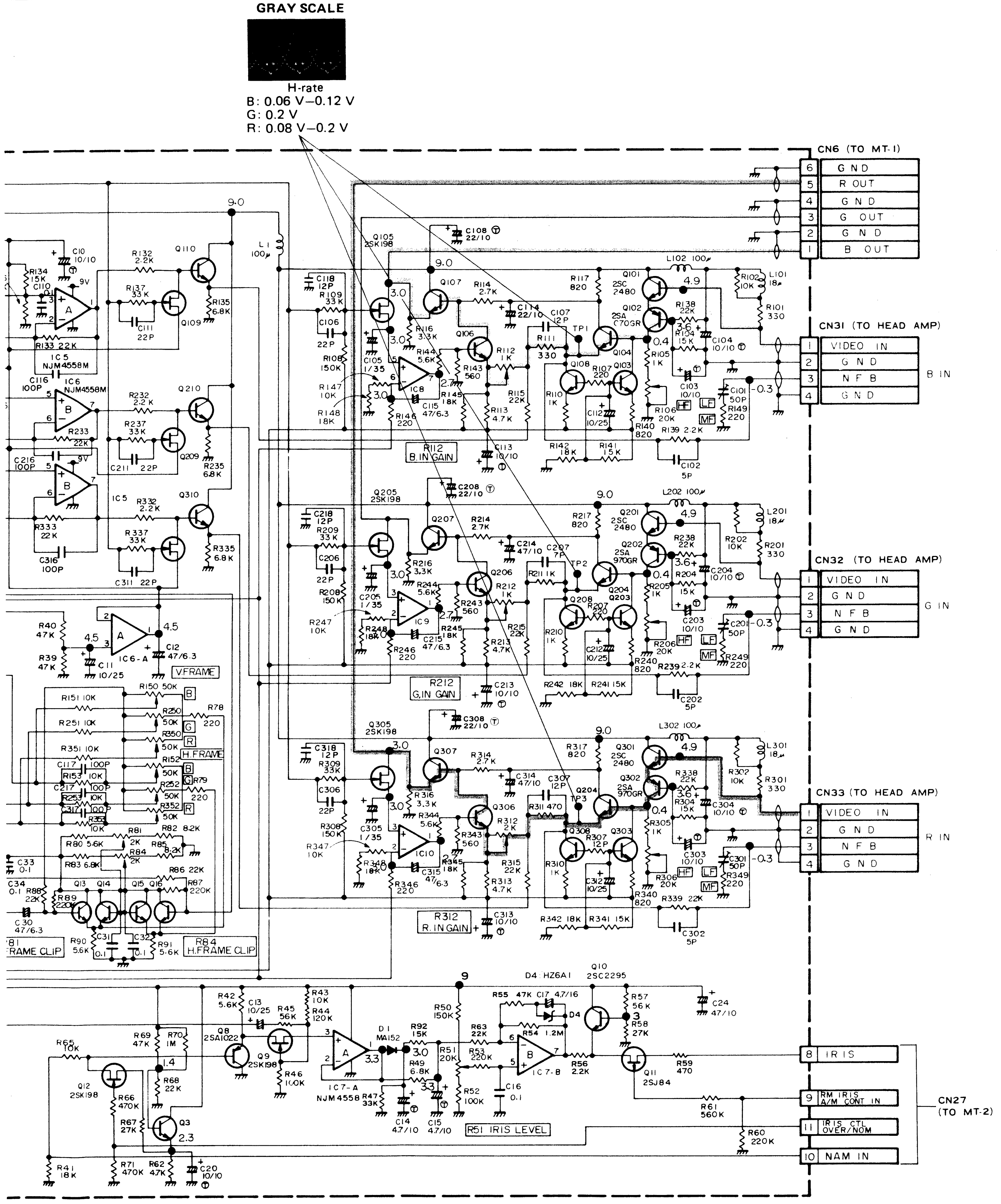

1
2
3
V_ 4
8 V+
7
6
5
V+
-
+
OUTPUT
V_

7.5 PA BOARD SCHEMATIC DIAGRAM

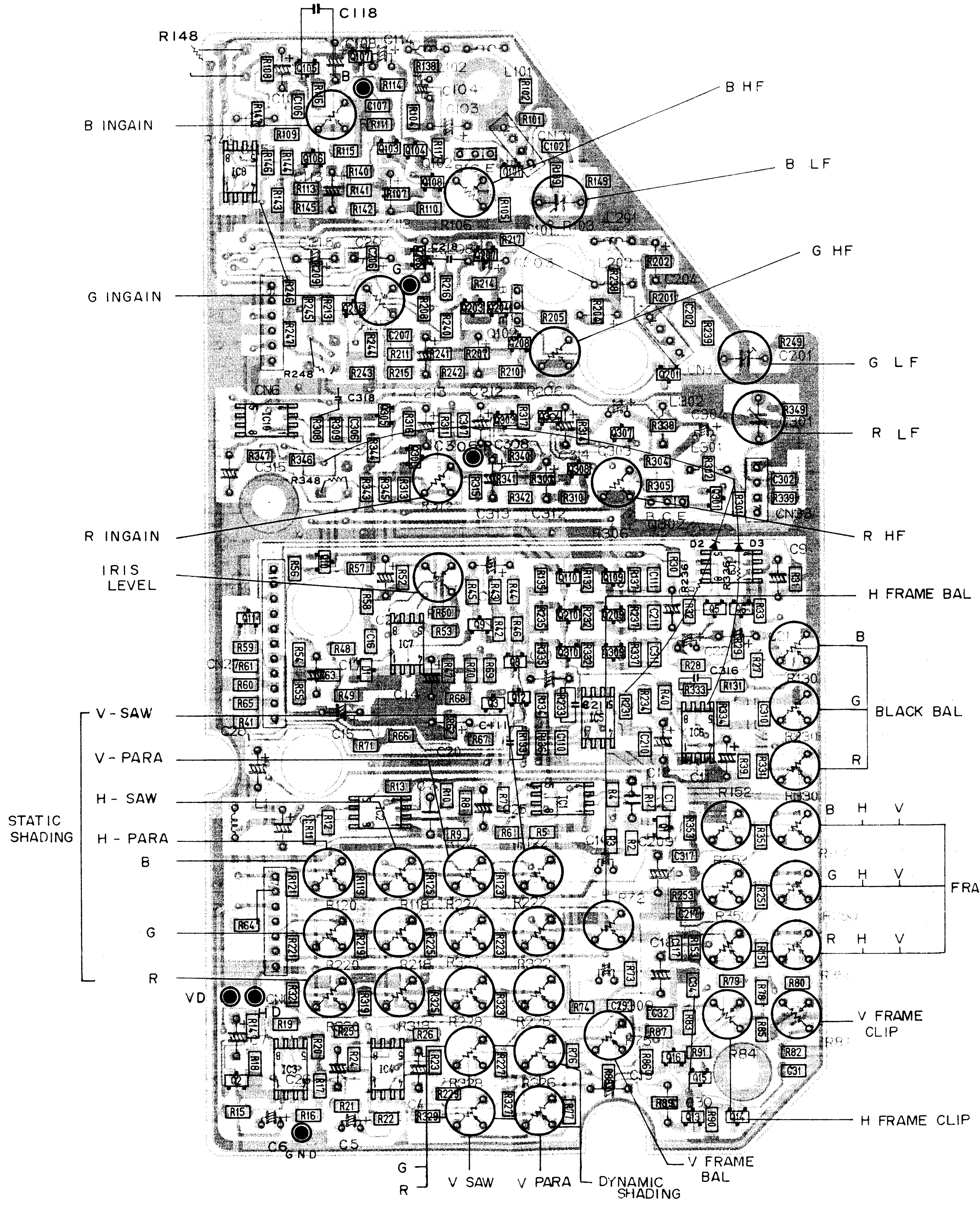

GRAY SCALE
H-rate
B: 0.06 V–0.12 V
G: 0.2 V
R: 0.08 V–0.2 V
CN8 (TO MT-2)
T BL 4
+9V IN 1
H.PARA OUT 5
C HD IN 2
V.PARA OUT 6
C VD IN 3
GND 7
CN27 (TO MT-2)
R DY-SH OUT 2
G DY-SH OUT 3
3V IN 5
-5V IN 6
4
SW 12V IN 1
GND 7
BLACK BALANCE
H.PARA STATIC
H.SAW STATIC
V.PARA STATIC
V.PARA DY.SH
H.FRAME BAL
V.SAW STATIC
V.SAW DY.SH
V.FRAME BAL
V.FRAME
H.FRAME
R81 V.FRAME CLIP
R84 H.FRAME CLIP
IC1 NJM4558
IC2 NJM4558M
IC3 NJM4558
IC4 NJM4558M
IC5 NJM4558M
IC6 NJM4558M
IC6-A
IC7-A NJM4558
IC7-B
IC8
IC9 NJM4558M
IC10
Q1 2SK198
Q2 2SK198
Q5 2SK198
Q6 2SK198
Q105 2SK198
Q205 2SK198
Q305 2SK198
Q101 2SC2480
Q102 2SA 970GR
Q201 2SC2480
Q202 2SA 970GR
Q301 2SC2480
Q302 2SA 970GR
Q8 2SA1022
Q9 2SK198
Q10 2SC2295
Q11 2SJ84
Q12 2SK198
D1 MA152
D3 MA152A
D4 HZ6A1
R112 B IN GAIN
R212 G IN GAIN
R312 R IN GAIN
R51 IRIS LEVEL
CN6 (TO MT-1)
6 GND
5 R OUT
4 GND
3 G OUT
2 GND
1 B OUT
CN31 (TO HEAD AMP)
1 VIDEO IN
2 GND
3 NFB
4 GND
B IN
CN32 (TO HEAD AMP)
1 VIDEO IN
2 GND
3 NFB
4 GND
G IN
CN33 (TO HEAD AMP)
1 VIDEO IN
2 GND
3 NFB
4 GND
R IN
CN27 (TO MT-2)
8 IRIS
9 RM IRIS A/M CONT IN
11 IRIS CTL OVER/NOM
10 NAM IN
HF LF MF
TP1 TP2 TP3
9.0 4.9 3.0 2.7 0.4 -0.3 4.5 4.4 3.3 1.4 2.3

7.6 PA

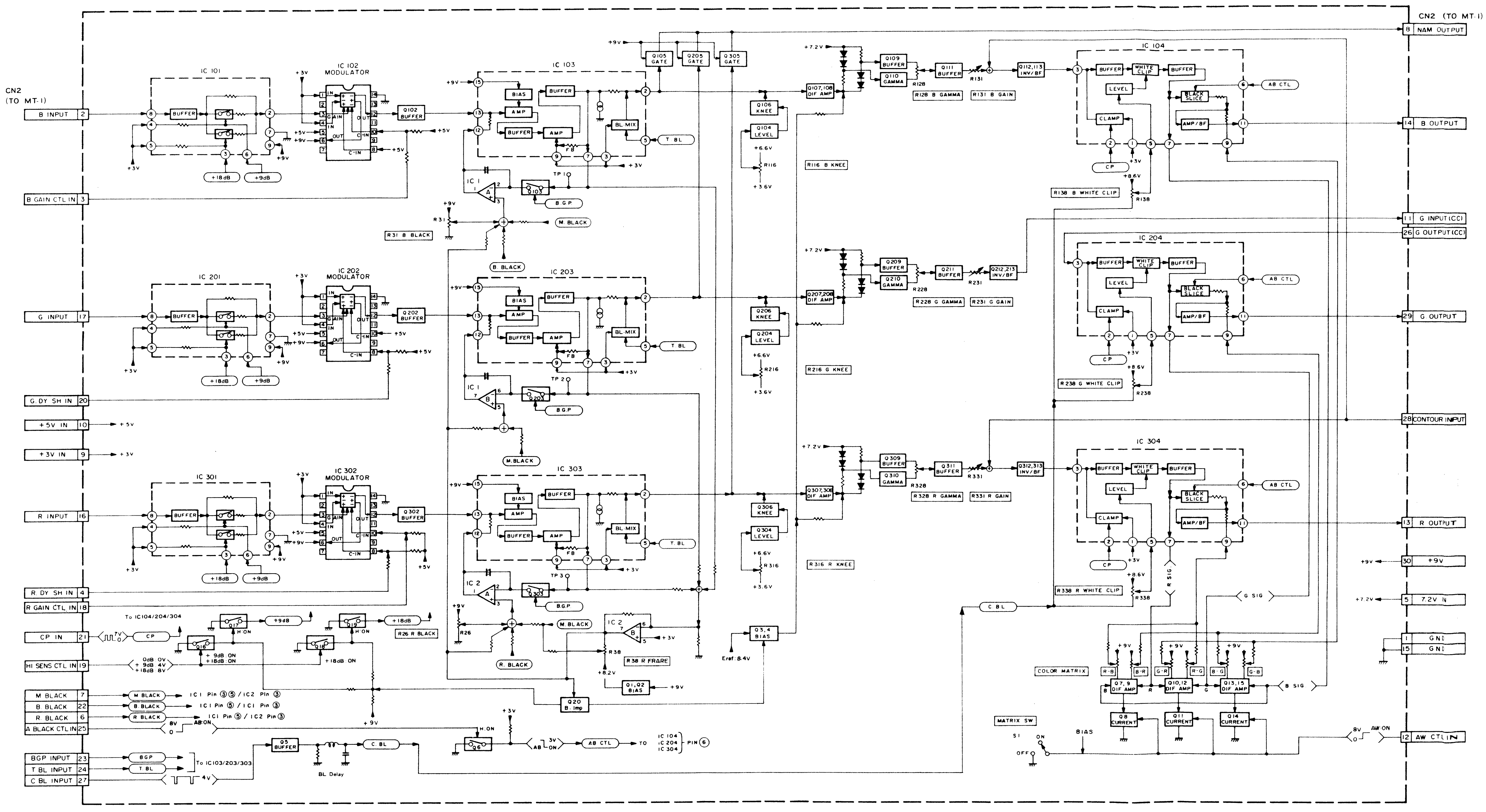

B INGA
G ING
R ING
IRIS LEV
V-S
V-P
H-S
H-F
STATIC SHADING

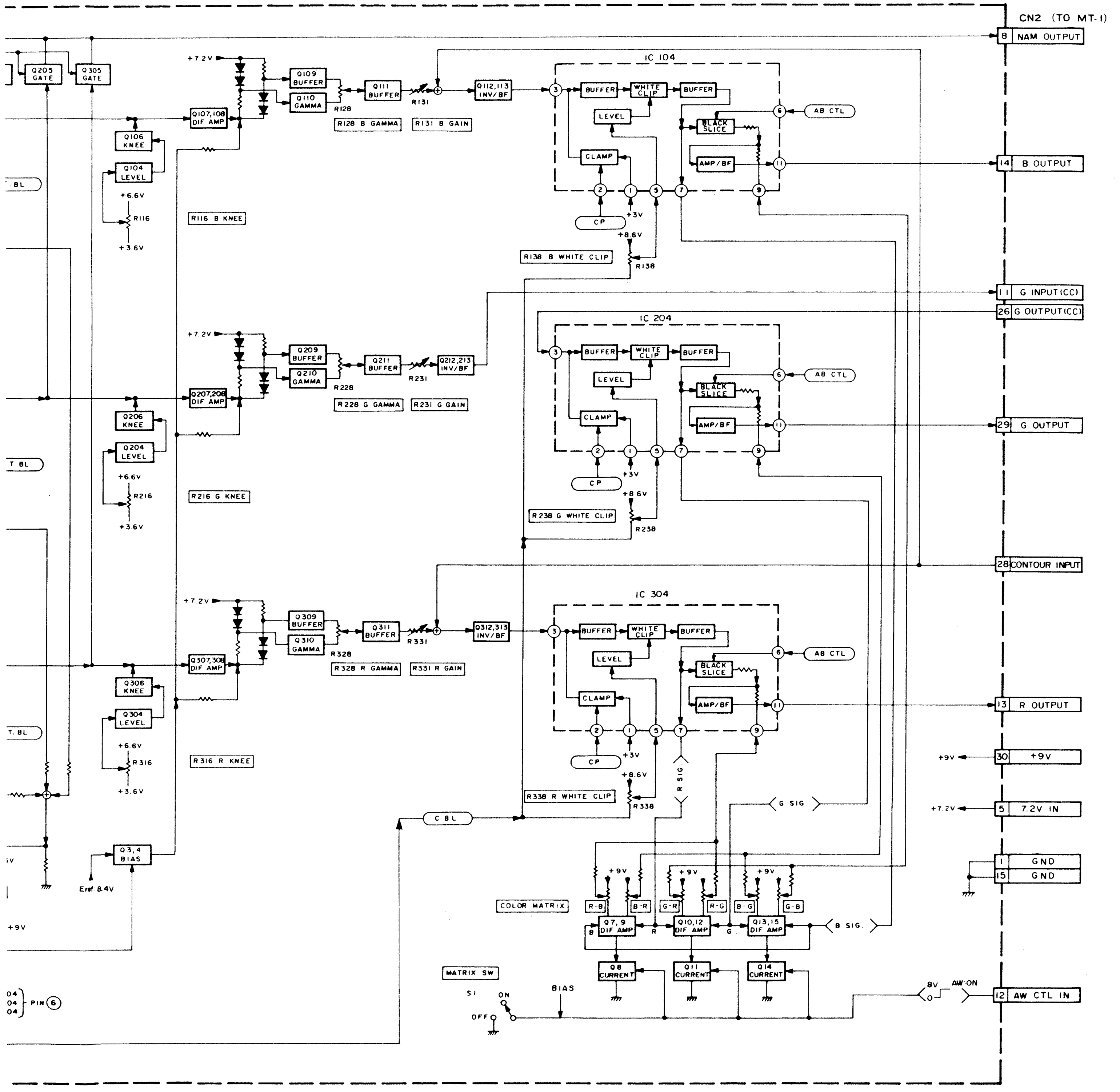

GRAY SCALE
H-rate
B: 0.06 V–0.12 V
G: 0.2 V
R: 0.08 V–0.2 V
CN6 (TO MT-1)
6 GND
5 R OUT
4 GND
3 G OUT
2 GND
1 B OUT
CN31 (TO HEAD AMP)
1 VIDEO IN
2 GND
3 NFB
4 GND
B IN
CN32 (TO HEAD AMP)
1 VIDEO IN
2 GND
3 NFB
4 GND
G IN
CN33 (TO HEAD AMP)
1 VIDEO IN
2 GND
3 NFB
4 GND
R IN
8 IRIS
9 RM IRIS A/M CONT IN
11 IRIS CTL OVER/NOM
10 NAM IN
CN27 (TO MT-2)
R112 B.IN GAIN
R212 G.IN GAIN
R312 R.IN GAIN
R51 IRIS LEVEL
VFRAME
H.FRAME
R81 FRAME CLIP
R84 H.FRAME CLIP
IC5 NJM4558M
IC6 NJM4558M
IC6-A
IC7-A NJM4558
IC7-B
IC8
IC9
IC10
Q105 2SK198
Q205 2SK198
Q305 2SK198
Q101 2SC2480
Q102 2SA970GR
Q201 2SC2480
Q202 2SA970GR
Q301 2SC2480
Q302 2SA970GR
Q8 2SA1022
Q9 2SK198
Q10 2SC2295
Q11 2SJ84
Q12 2SK198
D1 MA152
D4 HZ6A1
TP1
TP2
TP3
HF
LF
MF
9.0
4.9
3.6
3.0
2.7
0.4
-0.3
4.5
3.3
2.3

7.6 PA CIRCUIT BOARD

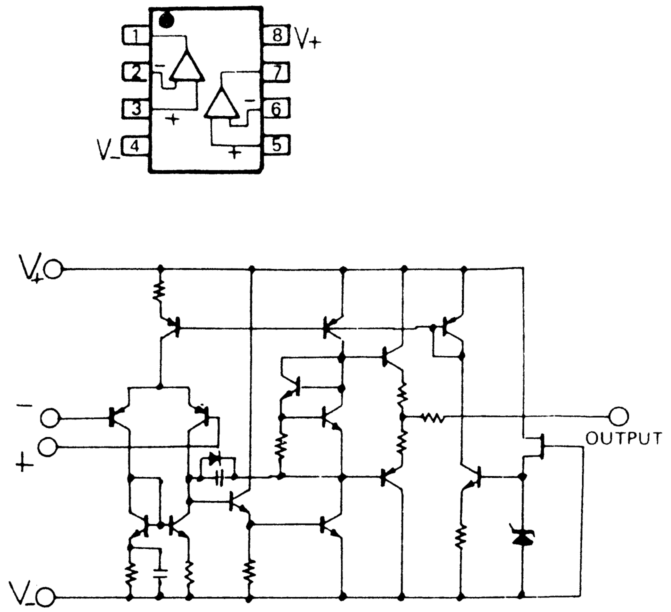

C118
R148
B INGAIN
B HF
B LF
G INGAIN
G HF
G LF
R LF
R INGAIN
R HF
IRIS LEVEL
H FRAME BAL
B
G
R
BLACK BAL
STATIC SHADING
V-SAW
V-PARA
H-SAW
H-PARA
B
G
R
B H V
G H V
R H V
FRAME
VD
V FRAME CLIP
H FRAME CLIP
C6
GND
C5
G
R
V SAW
V PARA
DYNAMIC SHADING
V FRAME BAL
CN6
CN38
IC7
IC8

7.7 VIDEO PROCESS BLOCK DIAGRAM (PR BOARD)

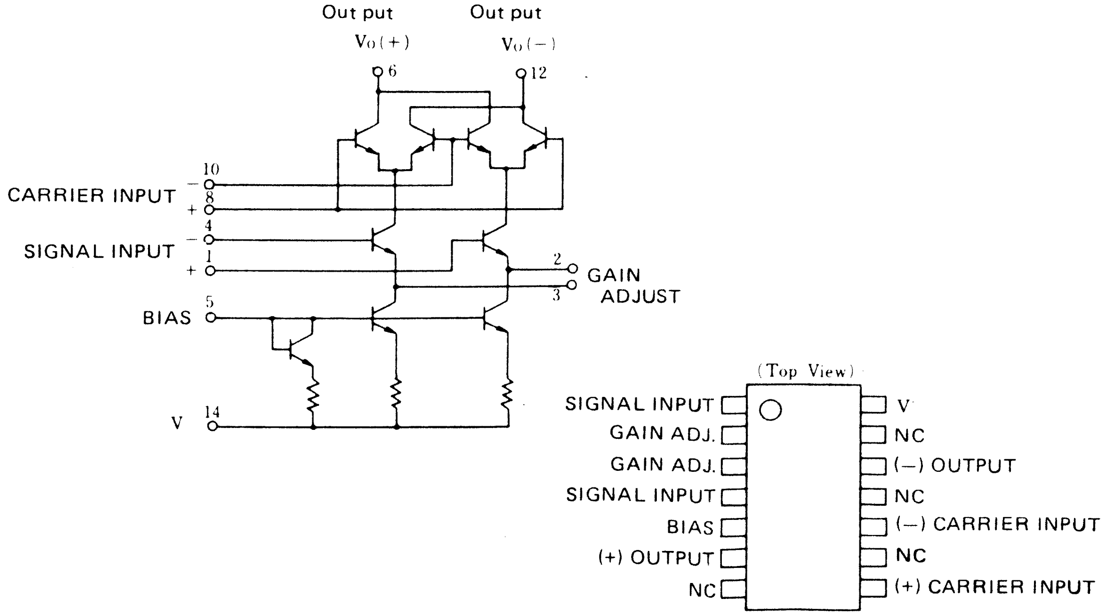

A
B
C
D
E
F
G
H
1
2
3
4
5
6
CN2
(TO MT-1)
B INPUT 2
B GAIN CTL IN 3
G INPUT 17
G.DY SH IN 20
+5V IN 10
+3V IN 9
R INPUT 16
R.DY SH IN 4
R GAIN CTL IN 18
CP IN 21
HI SENS CTL IN 19
M BLACK 7
B BLACK 22
R BLACK 6
A BLACK CTL IN 25
BGP INPUT 23
T BL INPUT 24
C BL INPUT 27
IC 101
IC 201
IC 301
BUFFER
+18dB
+9dB
IC 102 MODULATOR
IC 202 MODULATOR
IC 302 MODULATOR
GAIN
OUT
C-IN
Q102 BUFFER
Q202 BUFFER
Q302 BUFFER
IC 103
IC 203
IC 303
BIAS
AMP
BL MIX
FB
T BL
TP 1
TP 2
TP 3
IC 1
IC 2
Q103
Q203
Q303
B G P
M. BLACK
B. BLACK
R. BLACK
R31 B BLACK
R26 R BLACK
R38 R FRARE
Q1, Q2 BIAS
Q20 B. Imp
Q105 GATE
Q205 GATE
Q305 GATE
Q106 KNEE
Q206 KNEE
Q306 KNEE
Q104 LEVEL
Q204 LEVEL
Q304 LEVEL
R116 B KNEE
R216 G KNEE
R316 R KNEE
Q3, 4 BIAS
Eref: 8.4V
Q107,108 DIF AMP
Q207,208 DIF AMP
Q307,308 DIF AMP
Q109 BUFFER
Q110 GAMMA
Q209 BUFFER
Q210 GAMMA
Q309 BUFFER
Q310 GAMMA
R128 B GAMMA
R228 G GAMMA
R328 R GAMMA
Q111 BUFFER
Q211 BUFFER
Q311 BUFFER
R131 B GAIN
R231 G GAIN
R331 R GAIN
Q112,113 INV/BF
Q212,213 INV/BF
Q312,313 INV/BF
IC 104
IC 204
IC 304
WHITE CLIP
LEVEL
CLAMP
BLACK SLICE
AMP/BF
CP
AB CTL
R138 B WHITE CLIP
R238 G WHITE CLIP
R338 R WHITE CLIP
C BL
R SIG
G SIG
B SIG
COLOR MATRIX
R-B
B-R
G-R
R-G
B-G
G-B
Q7, 9 DIF AMP
Q10, 12 DIF AMP
Q13, 15 DIF AMP
Q8 CURRENT
Q11 CURRENT
Q14 CURRENT
MATRIX SW
S1
ON
OFF
BIAS
To IC104/204/304
Q17
Q16
Q19
Q18
H:ON
+9dB ON
+18dB ON
0dB 0V
+ 9dB 4V
+18dB 8V
IC1 Pin ③⑤ / IC2 Pin ③
IC1 Pin ⑤ / IC1 Pin ③
IC1 Pin ⑤ / IC2 Pin ③
AB:ON
To IC103/203/303
Q5 BUFFER
BL Delay
Q6
AB CTL
TO IC 104 IC 204 IC 304 PIN ⑥
CN2 (TO MT-1)
NAM OUTPUT 8
B OUTPUT 14
G INPUT(CC) 11
G OUTPUT(CC) 26
G OUTPUT 29
CONTOUR INPUT 28
R OUTPUT 13
+9V 30
7.2V IN 5
GND 1
GND 15
AW CTL IN 12
AW:ON
+9V
+3V
+5V
+7.2V
+6.6V
+3.6V
+8.6V
+8.2V


CN2 (TO MT-1)
8 NAM OUTPUT
14 B OUTPUT
11 G INPUT(CC)
26 G OUTPUT(CC)
29 G OUTPUT
28 CONTOUR INPUT
13 R OUTPUT
30 +9V
5 7.2V IN
1 GND
15 GND
12 AW CTL IN
IC 104
IC 204
IC 304
BUFFER
WHITE CLIP
LEVEL
BLACK SLICE
CLAMP
AMP/BF
AB CTL
CP
Q205 GATE
Q305 GATE
Q109 BUFFER
Q110 GAMMA
Q111 BUFFER
Q112,113 INV/BF
Q107,108 DIF AMP
Q106 KNEE
Q104 LEVEL
Q209 BUFFER
Q210 GAMMA
Q211 BUFFER
Q212,213 INV/BF
Q207,208 DIF AMP
Q206 KNEE
Q204 LEVEL
Q309 BUFFER
Q310 GAMMA
Q311 BUFFER
Q312,313 INV/BF
Q307,308 DIF AMP
Q306 KNEE
Q304 LEVEL
Q3,4 BIAS
R128 B GAMMA
R131 B GAIN
R116 B KNEE
R138 B WHITE CLIP
R228 G GAMMA
R231 G GAIN
R216 G KNEE
R238 G WHITE CLIP
R328 R GAMMA
R331 R GAIN
R316 R KNEE
R338 R WHITE CLIP
+7.2V
+6.6V
+3.6V
+3V
+8.6V
+9V
Eref 8.4V
C BL
G SIG
B SIG
R SIG
COLOR MATRIX
R-B
B-R
G-R
R-G
B-G
G-B
Q7,9 DIF AMP
Q10,12 DIF AMP
Q13,15 DIF AMP
Q8 CURRENT
Q11 CURRENT
Q14 CURRENT
MATRIX SW
S1
ON
OFF
BIAS
8V
AW/ON
PIN ⑥

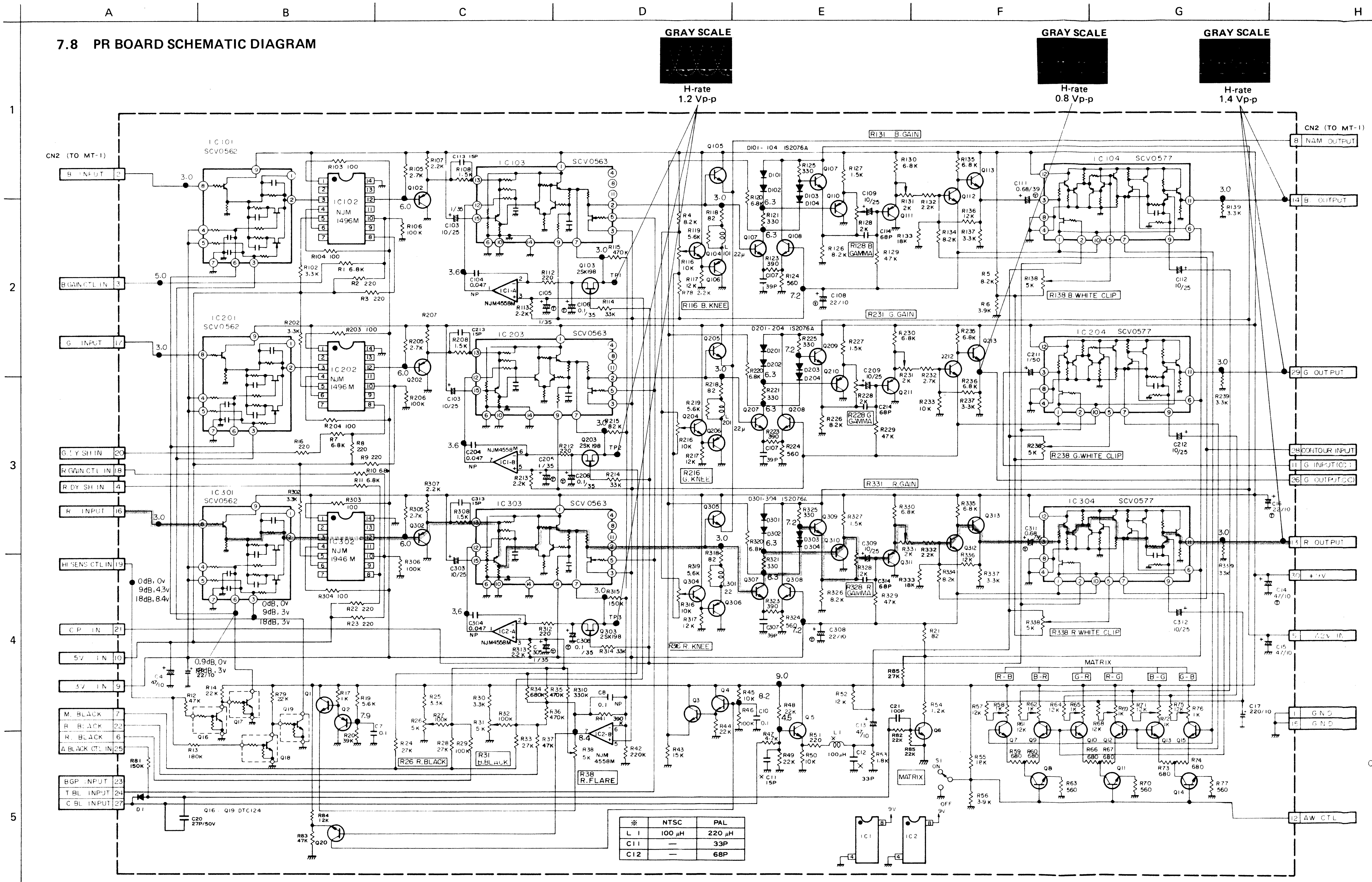
NJM4558M (Dual Op. Amp) [JRC]


1
2
3
4
5
6
7
8
V+
V−
−
+
OUTPUT

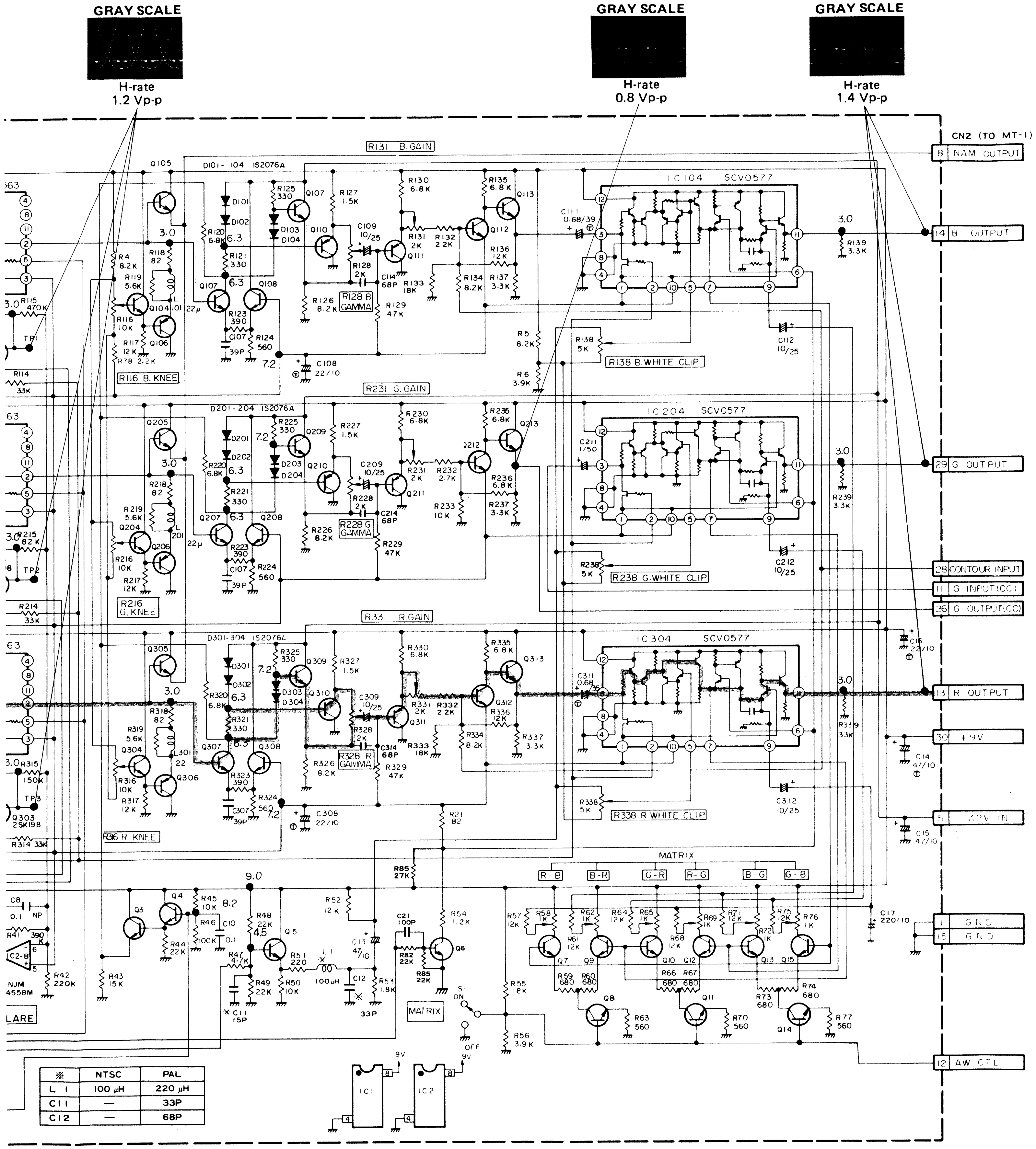
NJM1496(Double Balance Modulator/Demodulator)


Out put
Out put
Vo(+)
Vo(−)
6
12
10
8
4
1
5
14
2
3
CARRIER INPUT
SIGNAL INPUT
BIAS
V
GAIN ADJUST
(Top View)
SIGNAL INPUT
GAIN ADJ.
GAIN ADJ.
SIGNAL INPUT
BIAS
(+) OUTPUT
NC
V
NC
(−) OUTPUT
NC
(−) CARRIER INPUT
NC
(+) CARRIER INPUT

7.8 PR BOARD SCHEMATIC DIAGRAM

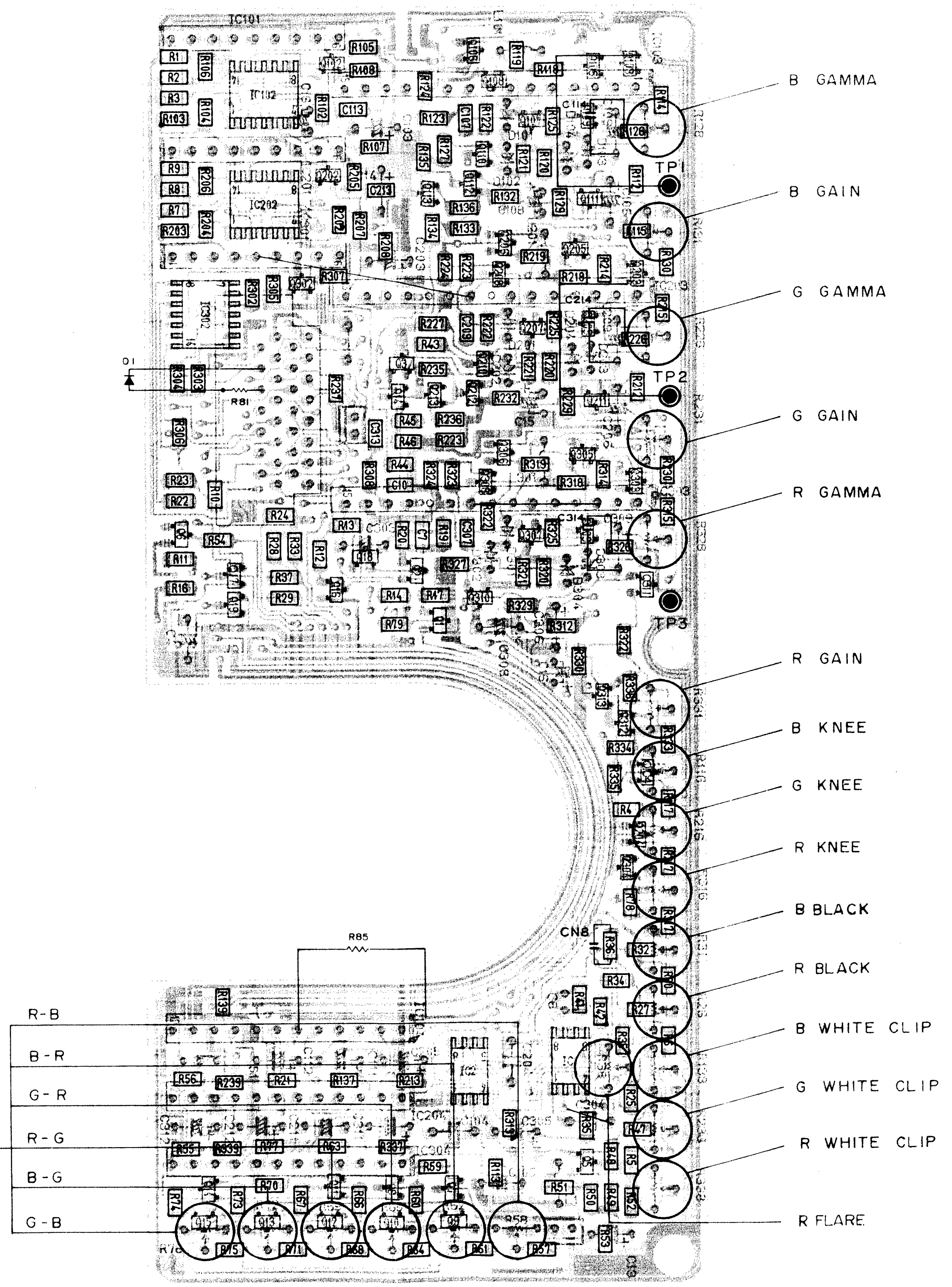

GRAY SCALE
H-rate
1.2 Vp-p
GRAY SCALE
H-rate
0.8 Vp-p
GRAY SCALE
H-rate
1.4 Vp-p
CN2 (TO MT-1)
B INPUT 2
B GAIN CTL IN 3
G INPUT 17
G-Y SH IN 20
R GAIN CTL IN 18
R DY SH IN 4
R INPUT 16
HI SENS CTL IN 19
CP IN 21
5V IN 10
3V IN 9
M. BLACK 7
R. BLACK 22
R. BLACK 6
A BLACK CTL IN 25
BGP INPUT 23
T.BL INPUT 24
C.BL INPUT 27
CN2 (TO MT-1)
8 NAM OUTPUT
14 B OUTPUT
29 G OUTPUT
28 CONTOUR INPUT
11 G INPUT(CC)
26 G OUTPUT(CC)
13 R OUTPUT
30 +9V
5 -12V IN
1 GND
15 GND
12 AW CTL
IC101 SCV0562
IC102 NJM 1496M
IC103 SCV0563
IC104 SCV0577
IC201 SCV0562
IC202 NJM 1496M
IC203 SCV0563
IC204 SCV0577
IC301 SCV0562
IC302 NJM 1946 M
IC303 SCV 0563
IC304 SCV0577
NJM4558M
R131 B.GAIN
R231 G.GAIN
R331 R.GAIN
R116 B.KNEE
R216 G.KNEE
R316 R.KNEE
R128 B GAMMA
R228 G GAMMA
R328 R GAMMA
R138 B.WHITE CLIP
R238 G.WHITE CLIP
R338 R.WHITE CLIP
R26 R.BLACK
R31 B.BLACK
R38 R.FLARE
MATRIX
R-B
B-R
G-R
R-G
B-G
G-B
D101-104 1S2076A
D201-204 1S2076A
D301-304 1S2076A
Q16 Q19 DTC124
0dB, 0v
9dB, 4.3v
18dB, 8.4v
0dB, 0v
9dB, 3v
18dB, 3v
0.9dB, 0v
18dB, 3v
S1
ON
OFF
COLOR MATR

※	NTSC	PAL
L 1	100 µH	220 µH
C 11	—	33P
C 12	—	68P

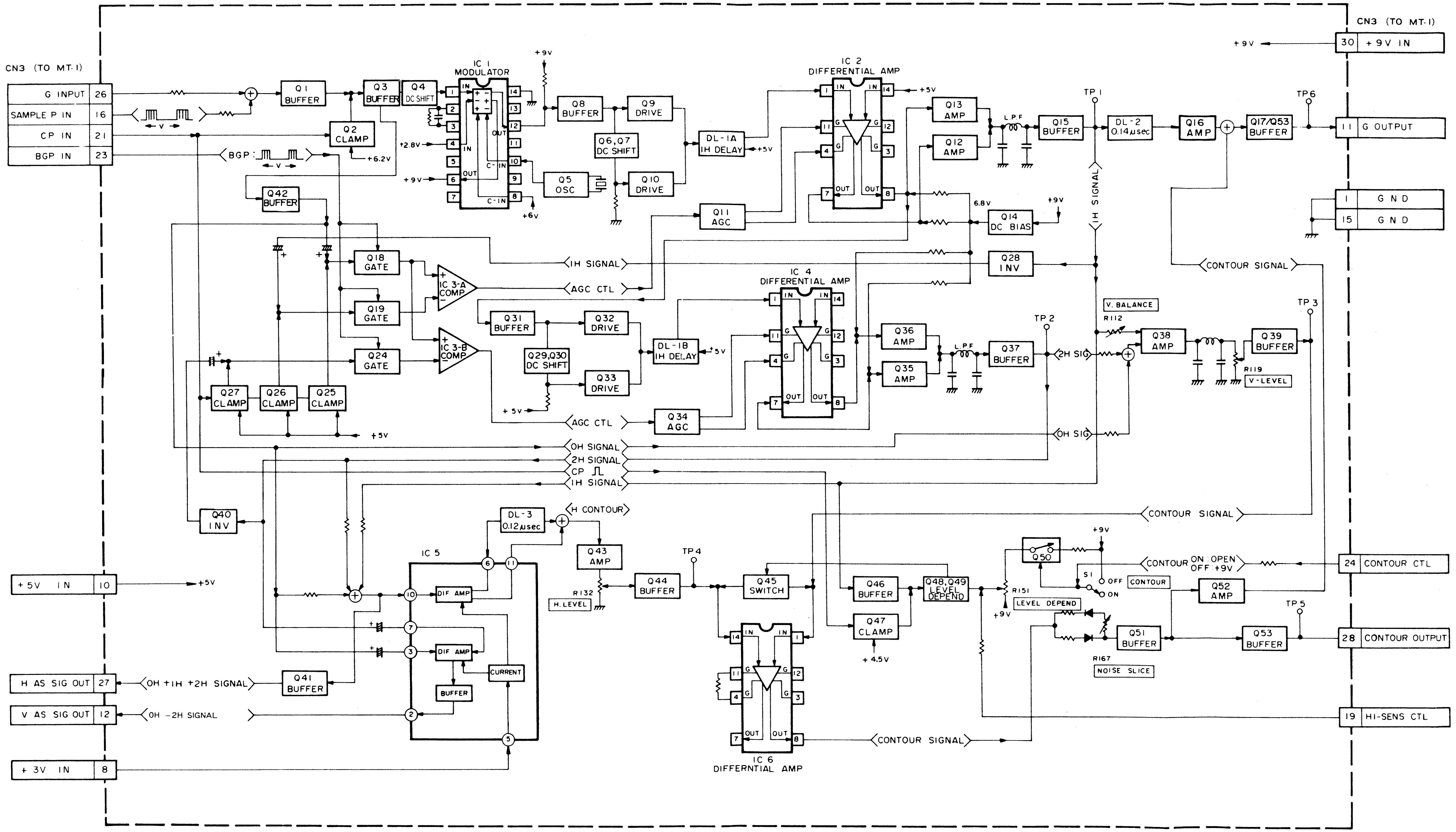

GRAY SCALE
H-rate 1.2 Vp-p
GRAY SCALE
H-rate 0.8 Vp-p
GRAY SCALE
H-rate 1.4 Vp-p
CN2 (TO MT-1)
8 NAM OUTPUT
14 B OUTPUT
29 G OUTPUT
28 CONTOUR INPUT
11 G INPUT(CC)
26 G OUTPUT(CC)
13 R OUTPUT
30 +9V
5 ADV IN
1 GND
15 GND
12 AW CTL
R131 B.GAIN
R231 G.GAIN
R331 R.GAIN
IC104 SCV0577
IC204 SCV0577
IC304 SCV0577
D101-104 1S2076A
D201-204 1S2076A
D301-304 1S2076A
R128 B GAMMA
R228 G GAMMA
R328 R GAMMA
R116 B.KNEE
R216 G.KNEE
R316 R.KNEE
R138 B.WHITE CLIP
R238 G.WHITE CLIP
R338 R.WHITE CLIP
MATRIX
R-B
B-R
G-R
R-G
B-G
G-B
NJM 4558M
FLARE
Q303 2SK198
TP1
TP2
TP3
S1 ON OFF
IC1
IC2
9V

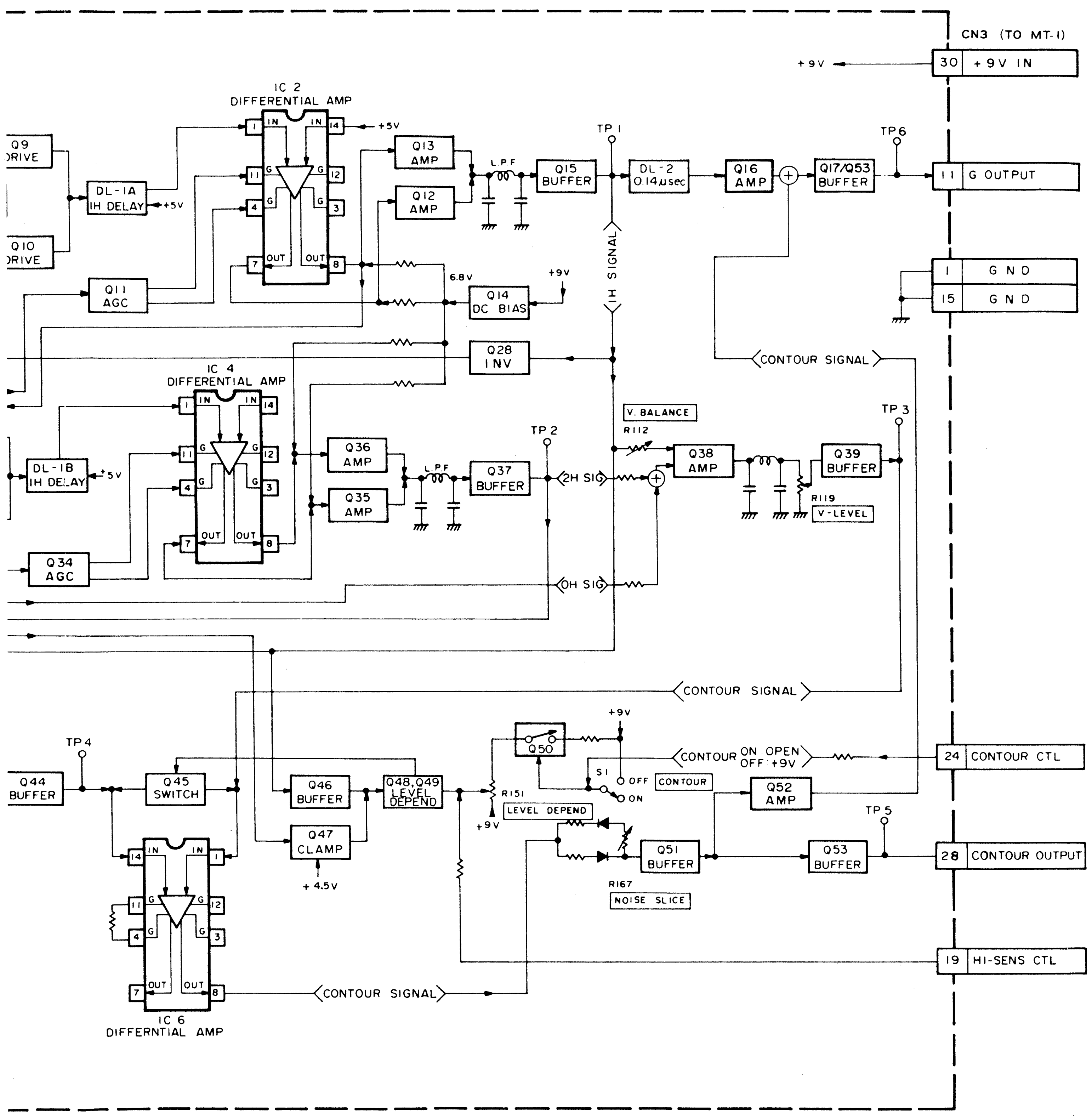
※	NTSC	PAL
L 1	100 μH	220 μH
C11	—	33P
C12	—	68P

7.9 PR CIRCUIT BOARD

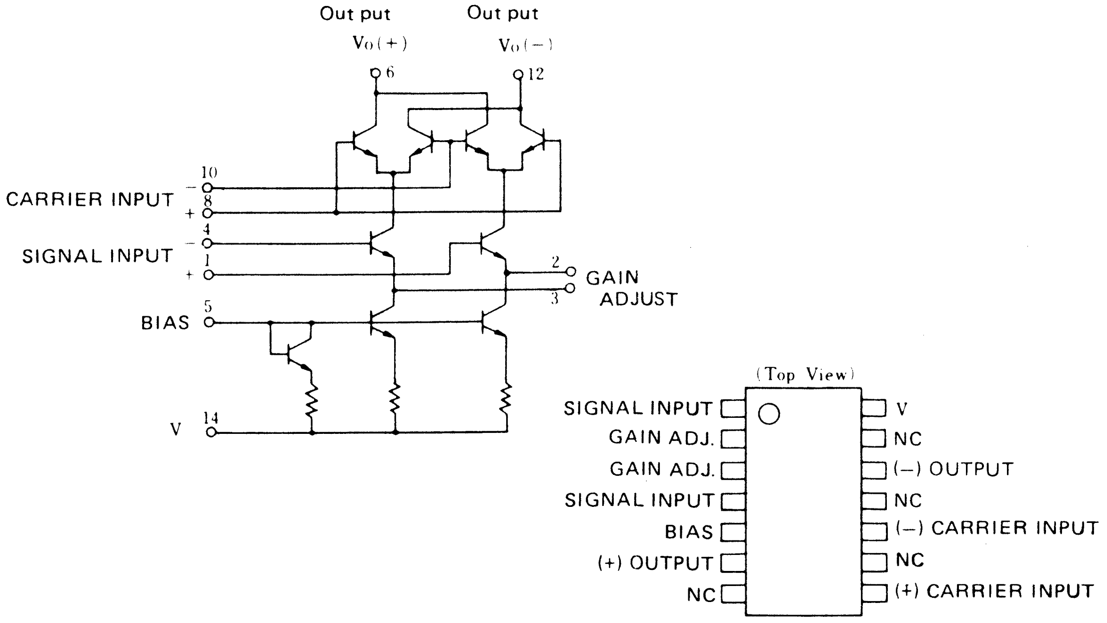

IC101
B GAMMA
TP1
B GAIN
G GAMMA
TP2
G GAIN
R GAMMA
TP3
R GAIN
B KNEE
G KNEE
R KNEE
B BLACK
R BLACK
B WHITE CLIP
G WHITE CLIP
R WHITE CLIP
R FLARE
CN8
R85
D1
COLOR MATRIX
R-B
B-R
G-R
R-G
B-G
G-B

7.10 CONTOUR CORRECTOR BLOCK DIAGRAM (CC BOARD)

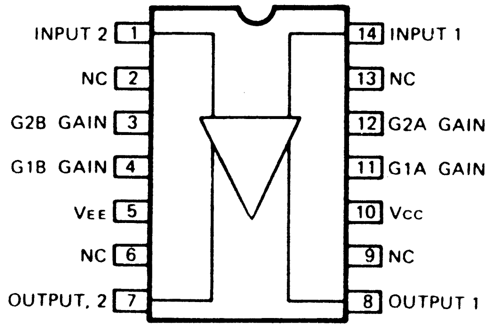

A
B
C
D
E
F
G
H
1
2
3
4
5
6
CN3 (TO MT-1)
G INPUT 26
SAMPLE P IN 16
CP IN 21
BGP IN 23
Q1 BUFFER
Q3 BUFFER
Q4 DC SHIFT
Q2 CLAMP
+6.2V
BGP
V
IC 1 MODULATOR
+2.8V
+9V
+6V
Q8 BUFFER
Q9 DRIVE
Q6,Q7 DC SHIFT
Q5 OSC
Q10 DRIVE
DL-1A 1H DELAY
+5V
IC 2 DIFFERENTIAL AMP
Q11 AGC
Q13 AMP
Q12 AMP
L.P.F
Q15 BUFFER
TP 1
DL-2 0.14μsec
Q16 AMP
Q17/Q53 BUFFER
TP6
6.8V
Q14 DC BIAS
1H SIGNAL
Q28 INV
CONTOUR SIGNAL
Q42 BUFFER
Q18 GATE
Q19 GATE
Q24 GATE
IC 3-A COMP
IC 3-B COMP
AGC CTL
Q31 BUFFER
Q32 DRIVE
Q29,Q30 DC SHIFT
Q33 DRIVE
DL-1B 1H DELAY
IC 4 DIFFERENTIAL AMP
Q36 AMP
Q35 AMP
Q37 BUFFER
TP 2
V. BALANCE
R112
Q38 AMP
Q39 BUFFER
TP 3
R119
V-LEVEL
2H SIG
0H SIG
Q27 CLAMP
Q26 CLAMP
Q25 CLAMP
+5V
Q34 AGC
0H SIGNAL
2H SIGNAL
CP
1H SIGNAL
Q40 INV
DL-3 0.12μsec
H CONTOUR
IC 5
DIF AMP
CURRENT
BUFFER
Q43 AMP
R132
H. LEVEL
TP4
Q44 BUFFER
Q45 SWITCH
Q46 BUFFER
Q47 CLAMP
+4.5V
Q48,Q49 LEVEL DEPEND
R151
LEVEL DEPEND
+9V
Q50
S1
OFF
ON
CONTOUR
CONTOUR ON OPEN OFF +9V
Q52 AMP
TP 5
Q51 BUFFER
Q53 BUFFER
R167
NOISE SLICE
IC 6 DIFFERNTIAL AMP
+5V IN 10
H AS SIG OUT 27
0H +1H +2H SIGNAL
Q41 BUFFER
V AS SIG OUT 12
0H -2H SIGNAL
+3V IN 8
CN3 (TO MT-1)
30 +9V IN
11 G OUTPUT
1 GND
15 GND
24 CONTOUR CTL
28 CONTOUR OUTPUT
19 HI-SENS CTL


CN3 (TO MT-1)
+9V
30 +9V IN
IC 2
DIFFERENTIAL AMP
+5V
Q9
DRIVE
Q10
DRIVE
DL-1A
1H DELAY
+5V
Q11
AGC
Q13
AMP
Q12
AMP
L.P.F
Q15
BUFFER
TP 1
DL-2
0.14μsec
Q16
AMP
Q17/Q53
BUFFER
TP6
11 G OUTPUT
1 GND
15 GND
6.8V
+9V
Q14
DC BIAS
1H SIGNAL
Q28
INV
CONTOUR SIGNAL
IC 4
DIFFERENTIAL AMP
DL-1B
1H DELAY
+5V
Q34
AGC
Q36
AMP
Q35
AMP
L.P.F
Q37
BUFFER
TP 2
2H SIG
0H SIG
V. BALANCE
R112
Q38
AMP
Q39
BUFFER
TP 3
R119
V-LEVEL
CONTOUR SIGNAL
TP4
Q44
BUFFER
Q45
SWITCH
Q46
BUFFER
Q48,Q49
LEVEL
DEPEND
Q47
CLAMP
+4.5V
R151
+9V
LEVEL DEPEND
Q50
+9V
CONTOUR ON OPEN
OFF +9V
24 CONTOUR CTL
S1
OFF
ON
CONTOUR
Q52
AMP
TP 5
Q51
BUFFER
Q53
BUFFER
28 CONTOUR OUTPUT
R167
NOISE SLICE
19 HI-SENS CTL
CONTOUR SIGNAL
IC 6
DIFFERNTIAL AMP
IN
OUT
G

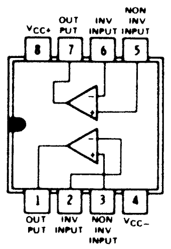
NJM1496(Double Balance Modulator/Demodulator)


Out put
Vo(+)
6
Out put
Vo(−)
12
CARRIER INPUT
10
8
SIGNAL INPUT
4
1
2
3
GAIN
ADJUST
BIAS
5
V
14
(Top View)
SIGNAL INPUT
GAIN ADJ.
GAIN ADJ.
SIGNAL INPUT
BIAS
(+) OUTPUT
NC
V
NC
(−) OUTPUT
NC
(−) CARRIER INPUT
NC
(+) CARRIER INPUT

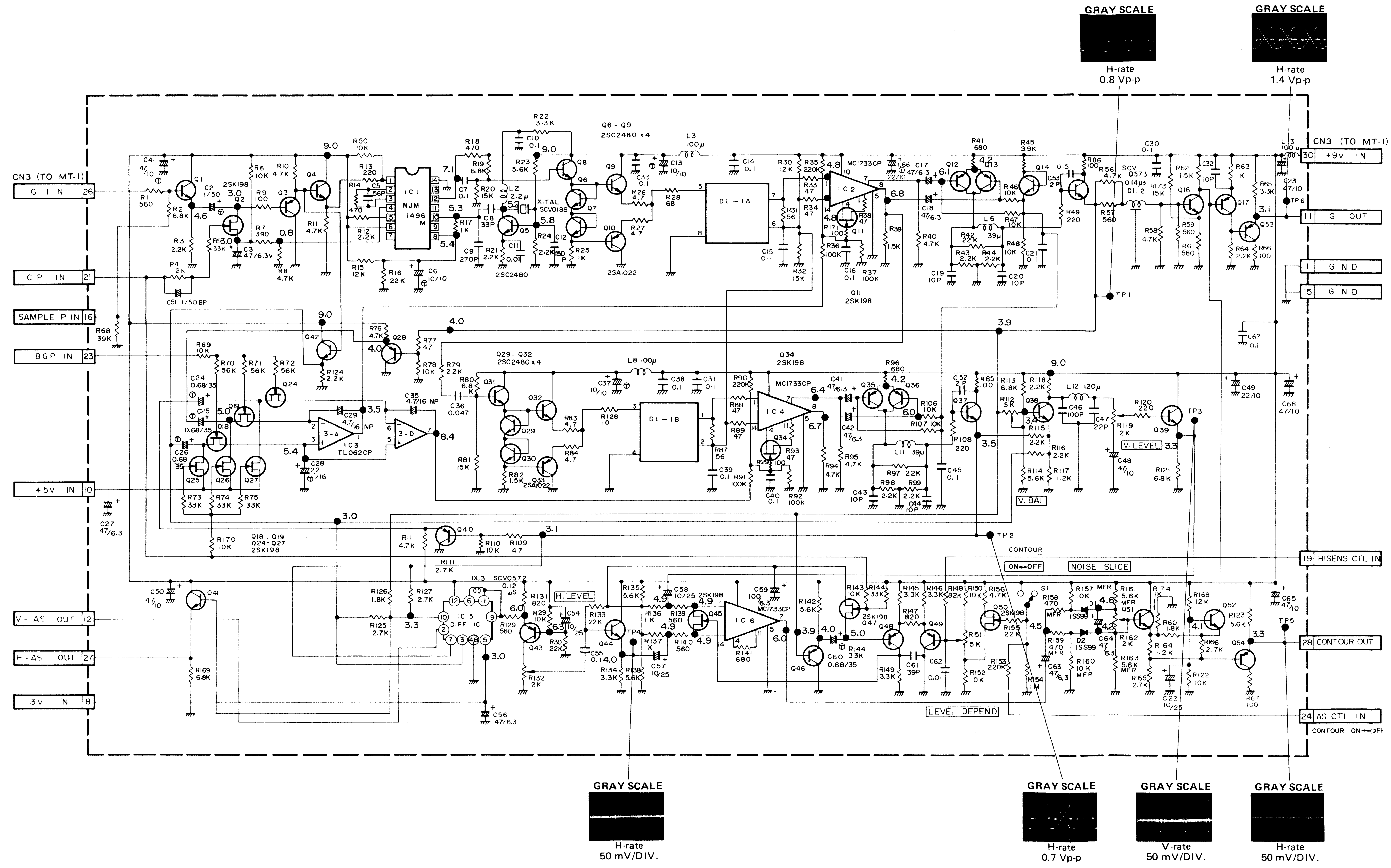
MC1733CP [MOTOROLA]

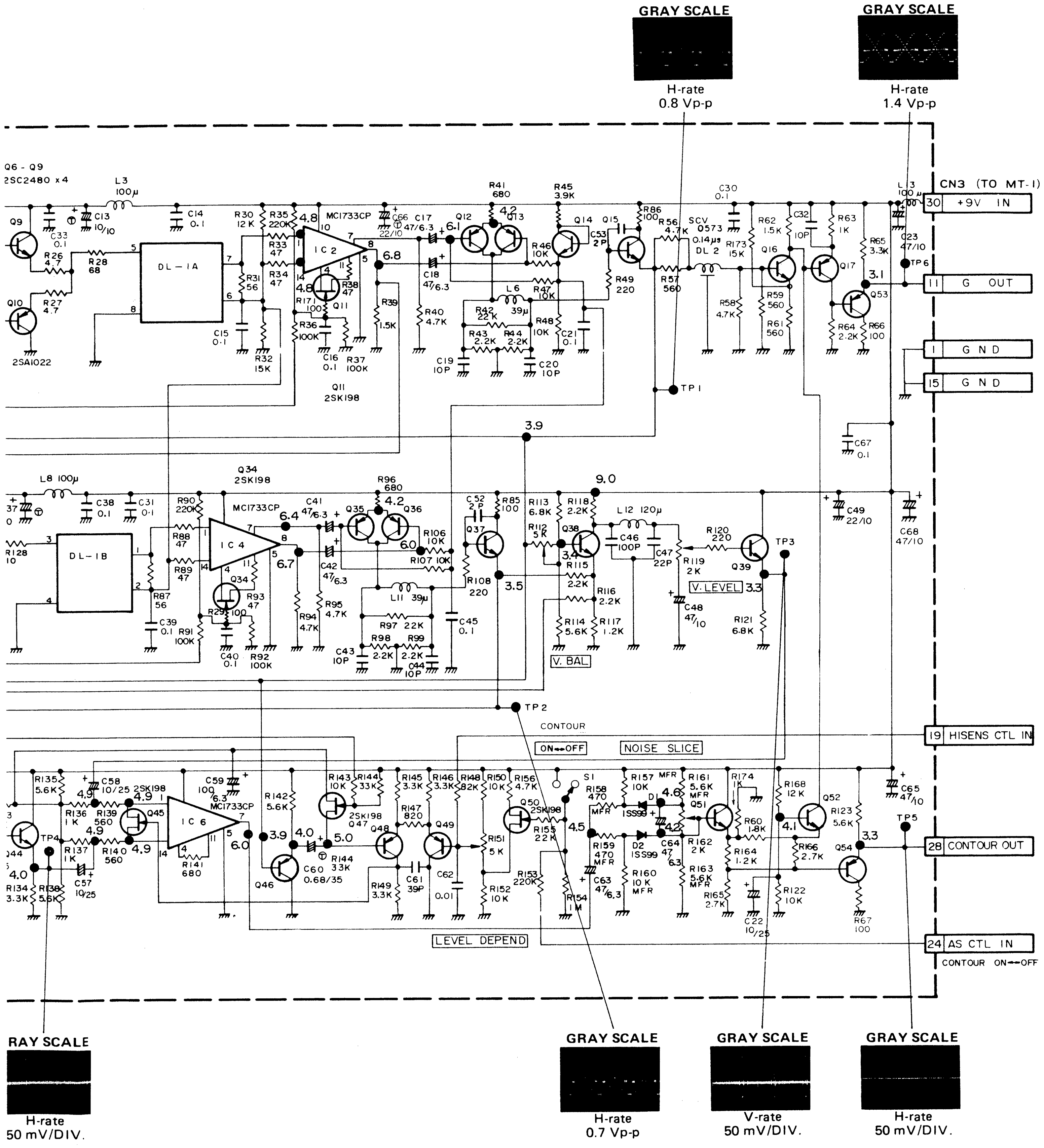

INPUT 2 1
NC 2
G2B GAIN 3
G1B GAIN 4
VEE 5
NC 6
OUTPUT. 2 7
14 INPUT 1
13 NC
12 G2A GAIN
11 G1A GAIN
10 Vcc
9 NC
8 OUTPUT 1

TL062CP [TEXAS]

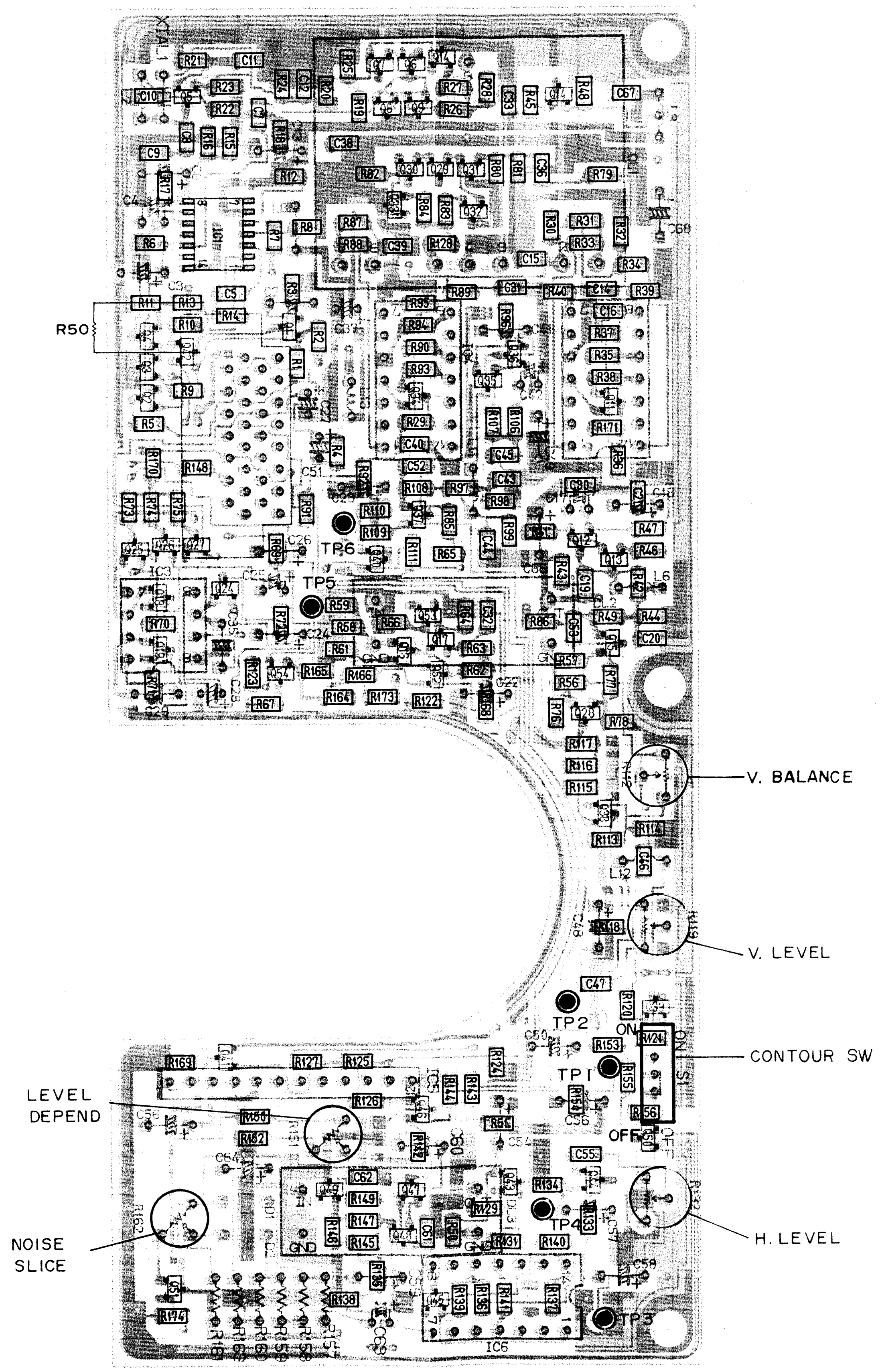

VCC+ 8
OUT PUT 7
INV INPUT 6
NON INV INPUT 5
OUT PUT 1
INV INPUT 2
NON INV INPUT 3
VCC− 4

7.11 CC BOARD SCHEMATIC DIAGRAM

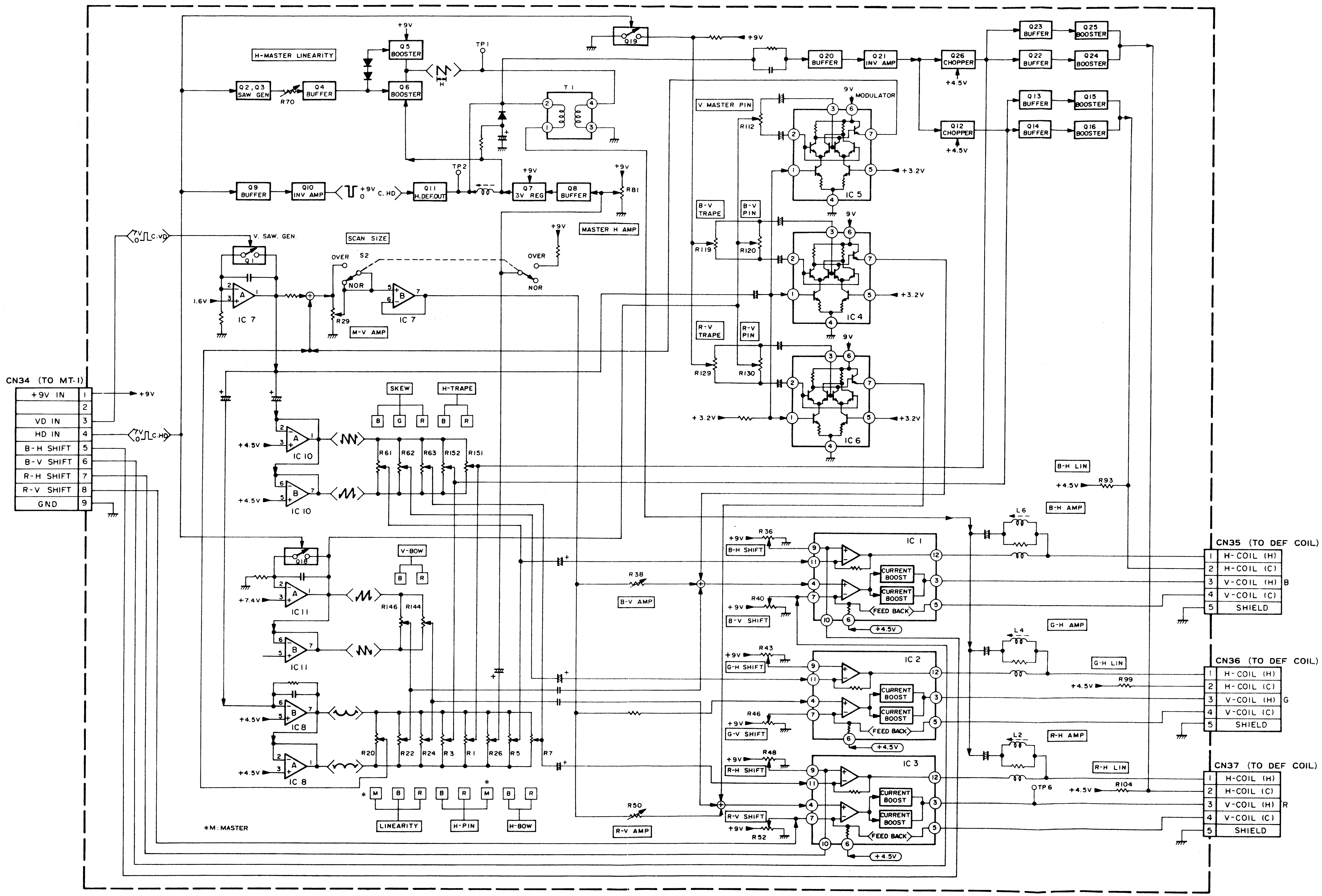

GRAY SCALE
H-rate
0.8 Vp-p
GRAY SCALE
H-rate
1.4 Vp-p
CN3 (TO MT-1)
G IN 26
CP IN 21
SAMPLE P IN 16
BGP IN 23
+5V IN 10
V-AS OUT 12
H-AS OUT 27
3V IN 8
CN3 (TO MT-1)
30 +9V IN
11 G OUT
1 GND
15 GND
19 HISENS CTL IN
28 CONTOUR OUT
24 AS CTL IN
CONTOUR ON↔OFF
IC1 NJM 1496 M
IC2 MC1733CP
IC3 TL062CP
IC4 MC1733CP
IC5 DIFF IC
IC6 MC1733CP
DL-1A
DL-1B
DL2 SCV0573 0.14μs
DL3 SCV0572 0.12μs
X-TAL SCV0188
Q6 - Q9 2SC2480 x 4
Q29 - Q32 2SC2480 x 4
Q18, Q19, Q24 - Q27 2SK198
Q11 2SK198
Q34 2SK198
Q33 2SA1022
Q10 2SA1022
Q5 2SC2480
Q2 2SK198
Q45 2SK198
Q47 2SK198
Q50 2SK198
H.LEVEL
V.LEVEL
V.BAL
CONTOUR ON↔OFF
NOISE SLICE
LEVEL DEPEND
S1
D1 1SS99
D2 1SS99
TP1
TP2
TP3
TP4
TP5
TP6
GRAY SCALE
H-rate
50 mV/DIV.
GRAY SCALE
H-rate
0.7 Vp-p
GRAY SCALE
V-rate
50 mV/DIV.
GRAY SCALE
H-rate
50 mV/DIV.


GRAY SCALE
H-rate
0.8 Vp-p
GRAY SCALE
H-rate
1.4 Vp-p
Q6 - Q9
2SC2480 x 4
L3 100μ
DL – 1A
MC1733CP
IC 2
Q11
2SK198
CN3 (TO MT-1)
30 +9V IN
11 G OUT
1 GND
15 GND
TP1
TP6
SCV 0573
DL 2
L8 100μ
DL – 1B
Q34
2SK198
MC1733CP
IC 4
L11 39μ
L12 120μ
V. LEVEL
V. BAL
TP3
TP2
CONTOUR
ON↔OFF
NOISE SLICE
19 HISENS CTL IN
28 CONTOUR OUT
24 AS CTL IN
CONTOUR ON↔OFF
MC1733CP
IC 6
2SK198
LEVEL DEPEND
TP4
TP5
S1
2SA1022
RAY SCALE
H-rate
50 mV/DIV.
GRAY SCALE
H-rate
0.7 Vp-p
GRAY SCALE
V-rate
50 mV/DIV.
GRAY SCALE
H-rate
50 mV/DIV.

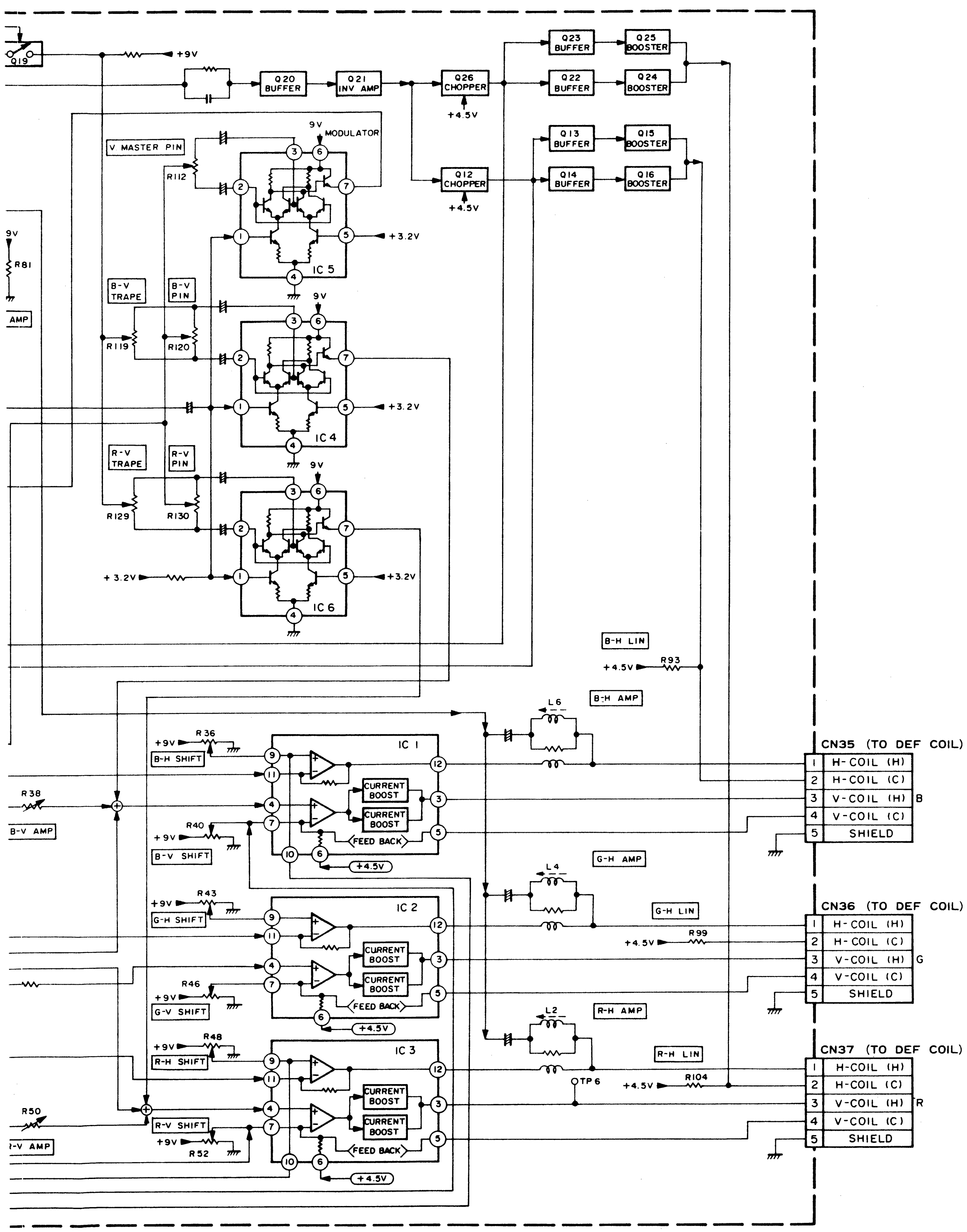
7.12 CC CIRCUIT BOARD


R50
V. BALANCE
V. LEVEL
CONTOUR SW
LEVEL DEPEND
NOISE SLICE
H. LEVEL
TP1
TP2
TP3
TP4
TP5
TP6
ON
OFF
IC6

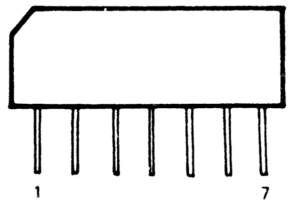
7.13 DEFLECTION BLOCK DIAGRAM (DF BOARD)

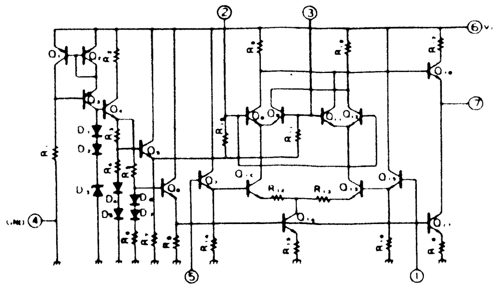


H-MASTER LINEARITY
Q2, Q3 SAW GEN
R70
Q4 BUFFER
+9V
Q5 BOOSTER
Q6 BOOSTER
TP1
T1
Q19
+9V
Q20 BUFFER
Q21 INV AMP
Q26 CHOPPER
+4.5V
Q23 BUFFER
Q25 BOOSTER
Q22 BUFFER
Q24 BOOSTER
Q13 BUFFER
Q15 BOOSTER
Q12 CHOPPER
Q14 BUFFER
Q16 BOOSTER
V MASTER PIN
MODULATOR
9V
R112
IC 5
+3.2V
TP2
Q9 BUFFER
Q10 INV AMP
C. HD
Q11 H.DEF.OUT
Q7 3V REG
Q8 BUFFER
R81
MASTER H AMP
B-V TRAPE
B-V PIN
R119
R120
IC 4
V. SAW. GEN.
C.VD
Q1
SCAN SIZE
OVER
S2
NOR
1.6V
IC 7
R29
M-V AMP
R-V TRAPE
R-V PIN
R129
R130
IC 6
CN34 (TO MT-1)
1 +9V IN
2
3 VD IN
4 HD IN
5 B-H SHIFT
6 B-V SHIFT
7 R-H SHIFT
8 R-V SHIFT
9 GND
C.HD
SKEW
H-TRAPE
B G R
B R
+4.5V
IC 10
R61 R62 R63 R152 R151
B-H LIN
R93
B-H AMP
L6
CN35 (TO DEF COIL)
1 H-COIL (H)
2 H-COIL (C)
3 V-COIL (H) B
4 V-COIL (C)
5 SHIELD
Q18
V-BOW
B R
+7.4V
IC 11
R146 R144
R36
B-H SHIFT
IC 1
CURRENT BOOST
FEED BACK
R38
B-V AMP
R40
B-V SHIFT
+4.5V
G-H AMP
L4
G-H LIN
CN36 (TO DEF COIL)
1 H-COIL (H)
2 H-COIL (C)
3 V-COIL (H) G
4 V-COIL (C)
5 SHIELD
R43
G-H SHIFT
IC 2
R99
R46
G-V SHIFT
IC 8
R20 R22 R24 R3 R1 R26 R5 R7
L2
R-H AMP
R-H LIN
R48
R-H SHIFT
IC 3
TP6
R104
CN37 (TO DEF COIL)
1 H-COIL (H)
2 H-COIL (C)
3 V-COIL (H) R
4 V-COIL (C)
5 SHIELD
M B R B R M B R
LINEARITY
H-PIN
H-BOW
*M: MASTER
R50
R-V AMP
R-V SHIFT
R52

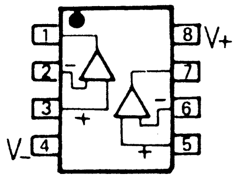

Q19
+9V
Q20 BUFFER
Q21 INV AMP
Q26 CHOPPER
+4.5V
Q23 BUFFER
Q25 BOOSTER
Q22 BUFFER
Q24 BOOSTER
Q13 BUFFER
Q15 BOOSTER
Q12 CHOPPER
Q14 BUFFER
Q16 BOOSTER
V MASTER PIN
R112
9V
MODULATOR
IC 5
+3.2V
9V
R81
AMP
B-V TRAPE
B-V PIN
R119
R120
IC 4
R-V TRAPE
R-V PIN
R129
R130
IC 6
+3.2V
B-H LIN
R93
B-H AMP
L6
IC 1
R36
B-H SHIFT
R38
B-V AMP
R40
B-V SHIFT
CURRENT BOOST
FEED BACK
CN35 (TO DEF COIL)
1 H-COIL (H)
2 H-COIL (C)
3 V-COIL (H)
4 V-COIL (C)
5 SHIELD
B
G-H AMP
L4
IC 2
R43
G-H SHIFT
G-H LIN
R99
R46
G-V SHIFT
CN36 (TO DEF COIL)
1 H-COIL (H)
2 H-COIL (C)
3 V-COIL (H)
4 V-COIL (C)
5 SHIELD
G
L2
R-H AMP
IC 3
R48
R-H SHIFT
R-H LIN
TP6
R104
R50
R-V AMP
R-V SHIFT
R52
CN37 (TO DEF COIL)
1 H-COIL (H)
2 H-COIL (C)
3 V-COIL (H)
4 V-COIL (C)
5 SHIELD
R

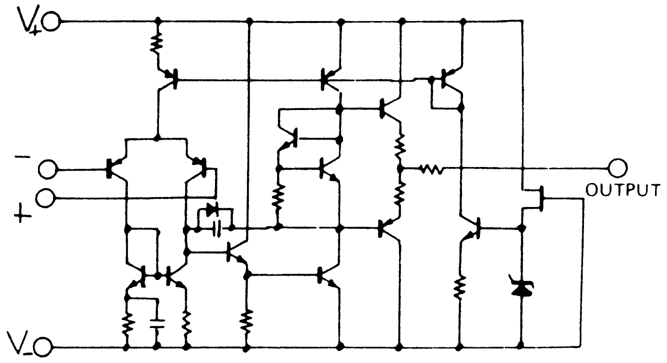
AN614 (Balance Modulator) [MATSUSHITA]



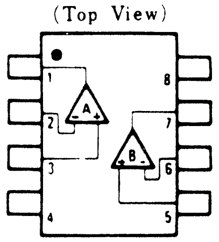


NJM4558M (Dual Op. Amp) [JRC]

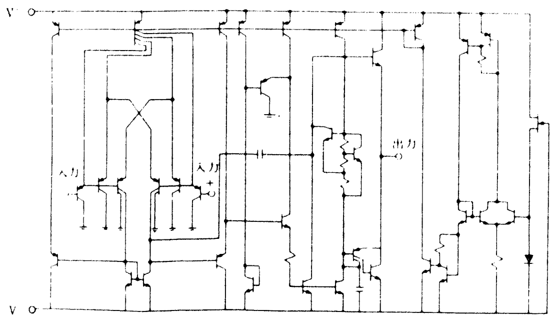

1
2
3
V_ 4
8 V+
7
6
5



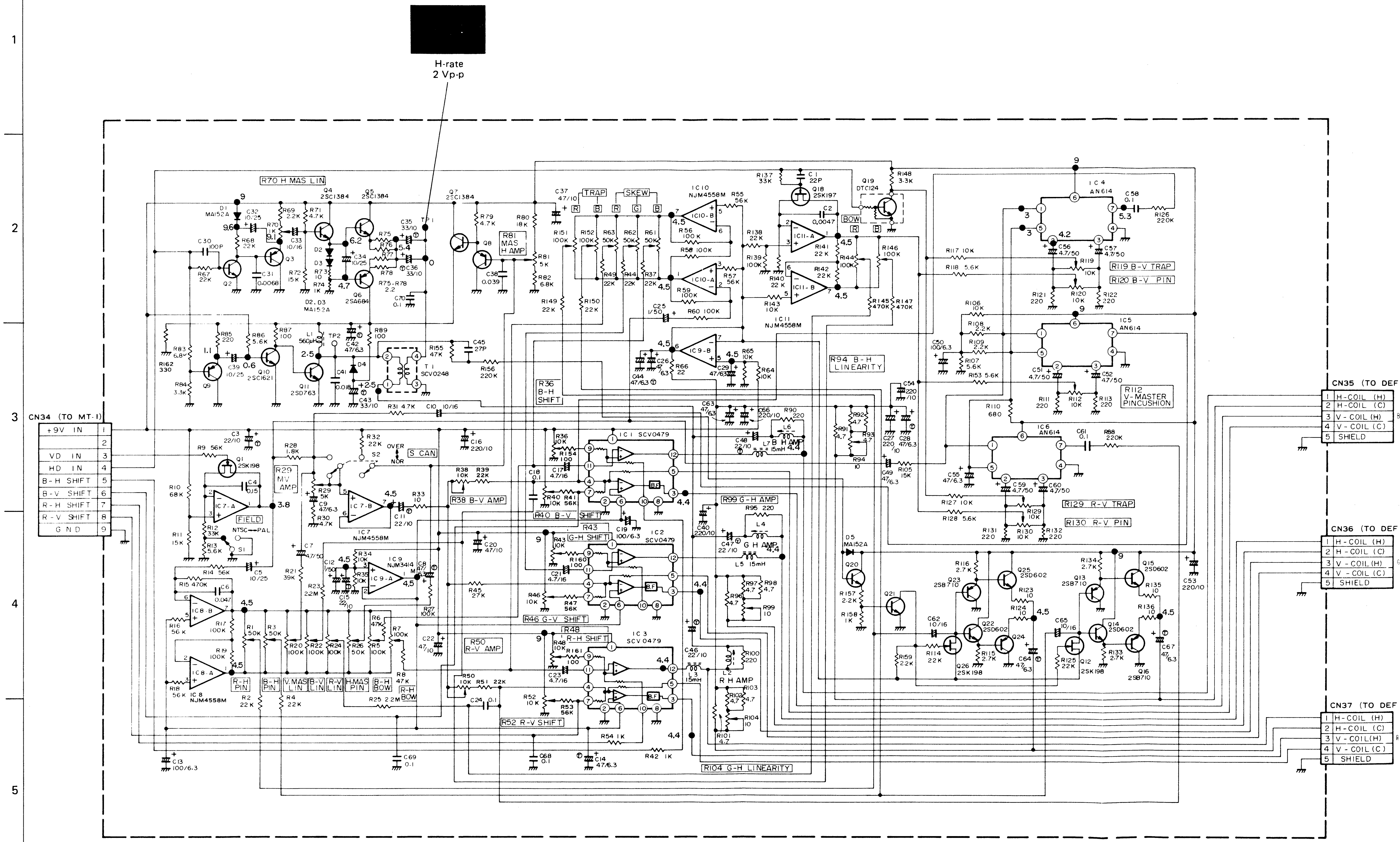
NJM3414M (Dual OP. Amp.) [JRC]

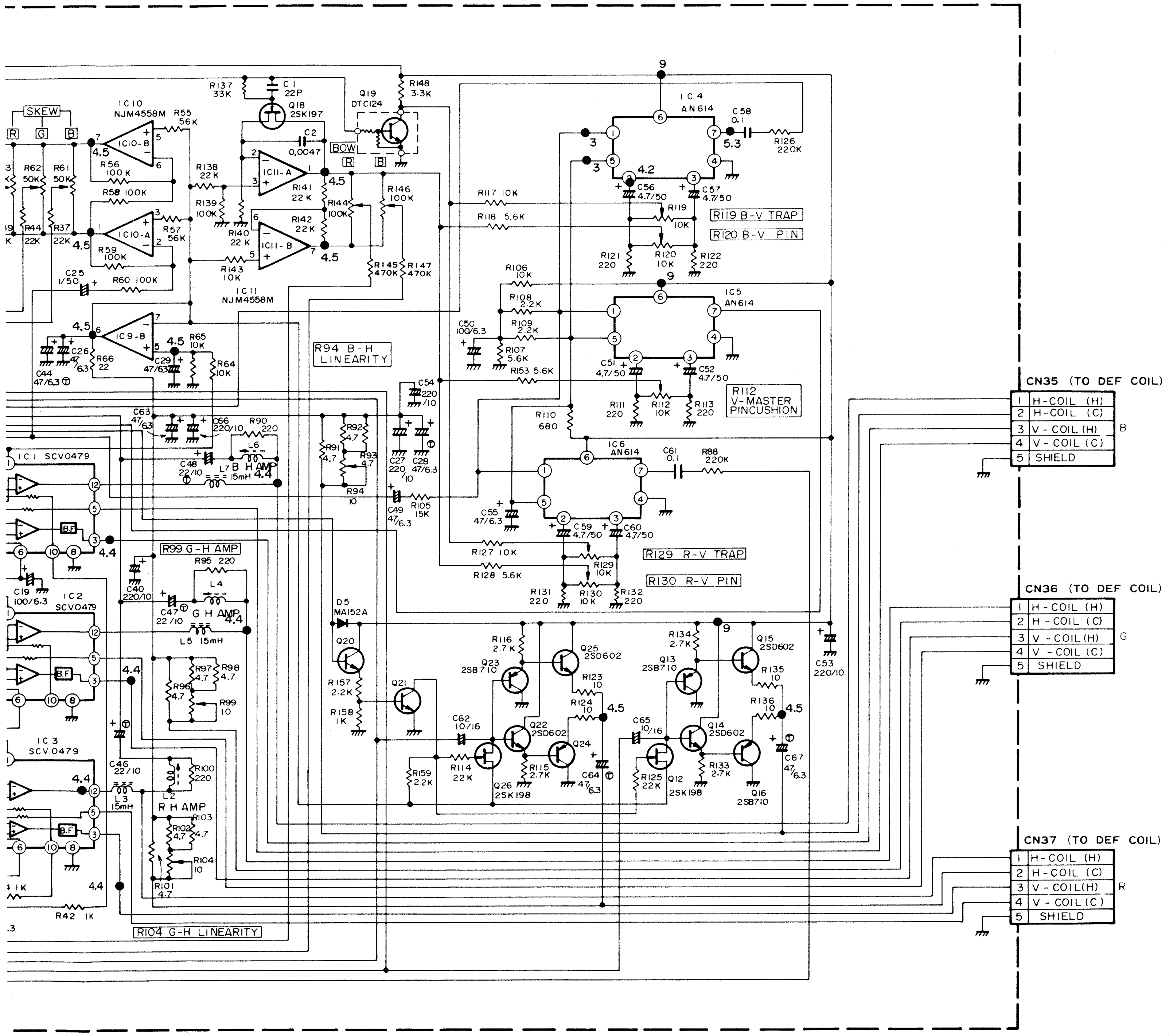

(Top View)
A
B
1
2
3
4
5
6
7
8

1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. GROUND
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V·

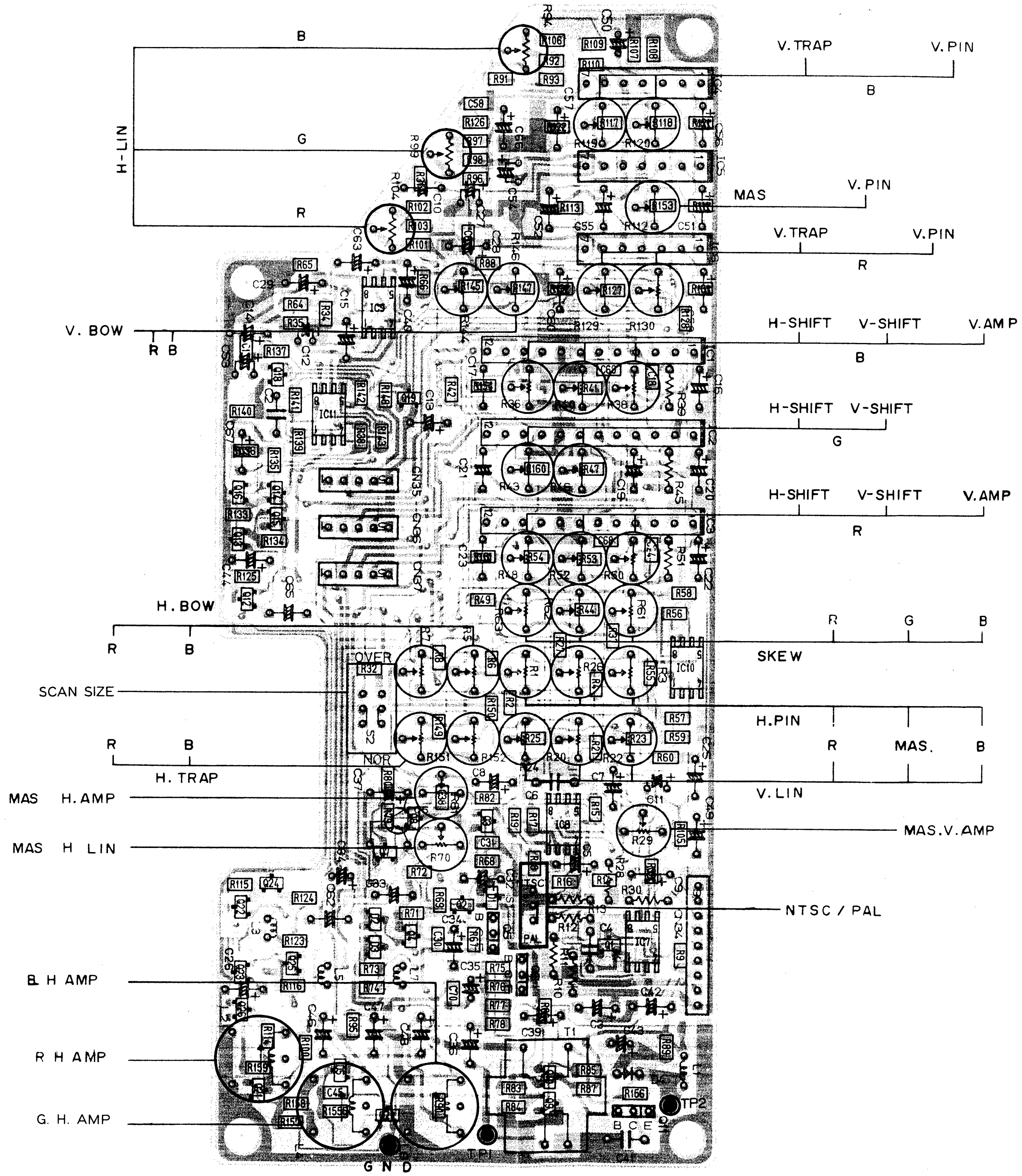


7.14 DF BOARD SCHEMATIC DIAGRAM

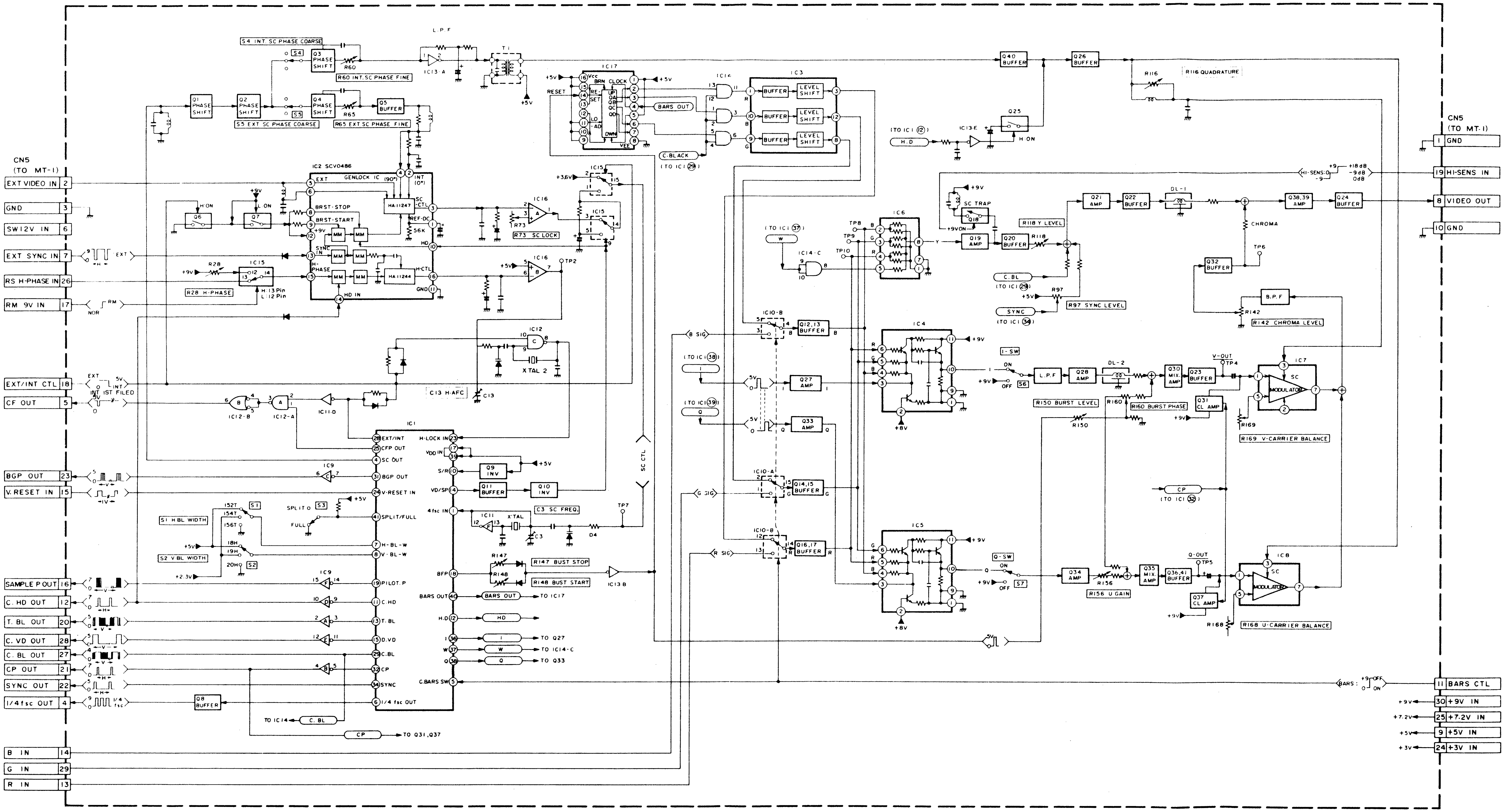

H-rate
2 Vp-p
TP1
R70 H MAS LIN
R81 MAS H AMP
TRAP
SKEW
BOW
Q4 2SC1384
Q5 2SC1384
Q6 2SA684
Q7 2SC1384
D1 MA152A
D2, D3 MA152A
Q9
Q10 2SC1621
Q11 2SD763
L1 560μH
TP2
T1 SCV0248
IC10 NJM4558M
IC11 NJM4558M
Q18 2SK197
Q19 DTC124
IC4 AN614
IC5 AN614
IC6 AN614
R119 B-V TRAP
R120 B-V PIN
R112 V-MASTER PINCUSHION
R94 B-H LINEARITY
R36 B-H SHIFT
R129 R-V TRAP
R130 R-V PIN
CN34 (TO MT-1)
+9V IN 1
2
VD IN 3
HD IN 4
B-H SHIFT 5
B-V SHIFT 6
R-H SHIFT 7
R-V SHIFT 8
GND 9
Q1 2SK198
IC7-A
FIELD
NTSC—PAL
S1
S2
OVER
NOR
S CAN
R29 MV AMP
IC7 NJM4558M
R38 B-V AMP
R40 B-V SHIFT
IC1 SCV0479
IC2 SCV0479
IC3 SCV0479
R43 G-H SHIFT
R46 G-V SHIFT
R48 R-H SHIFT
R50 R-V AMP
R52 R-V SHIFT
B.F
IC9 NJM3414
IC8 NJM4558M
R-H PIN
B-H PIN
V.MAS LIN
B-V LIN
R-V LIN
H.MAS PIN
B-H BOW
R-H BOW
R99 G-H AMP
G H AMP
B H AMP
R H AMP
L3 15mH
L5 15mH
L7 15mH
R104 G-H LINEARITY
D5 MA152A
Q20
Q21
Q23 2SB710
Q25 2SD602
Q22 2SD602
Q24
Q26 2SK198
Q13 2SB710
Q15 2SD602
Q14 2SD602
Q12 2SK198
Q16 2SB710
CN35 (TO DEF COIL)
CN36 (TO DEF COIL)
CN37 (TO DEF COIL)
1 H-COIL (H)
2 H-COIL (C)
3 V-COIL (H)
4 V-COIL (C)
5 SHIELD


SKEW
R G B
IC10 NJM4558M
IC10-B
IC10-A
IC9-B
IC11 NJM4558M
IC11-A
IC11-B
Q18 2SK197
Q19 DTC124
BOW
B
R
IC4 AN614
IC5 AN614
IC6 AN614
R119 B-V TRAP
R120 B-V PIN
R94 B-H LINEARITY
R112 V-MASTER PINCUSHION
R129 R-V TRAP
R130 R-V PIN
R99 G-H AMP
R104 G-H LINEARITY
B H AMP
G H AMP
R H AMP
IC1 SCV0479
IC2 SCV0479
IC3 SCV0479
B.F
D5 MA152A
Q20
Q21
Q23 2SB710
Q25 2SD602
Q22 2SD602
Q24
Q26 2SK198
Q13 2SB710
Q15 2SD602
Q14 2SD602
Q12 2SK198
Q16 2SB710
CN35 (TO DEF COIL)
1 H-COIL (H)
2 H-COIL (C)
3 V-COIL (H)
4 V-COIL (C)
5 SHIELD
B
CN36 (TO DEF COIL)
1 H-COIL (H)
2 H-COIL (C)
3 V-COIL (H)
4 V-COIL (C)
5 SHIELD
G
CN37 (TO DEF COIL)
1 H-COIL (H)
2 H-COIL (C)
3 V-COIL(H)
4 V-COIL (C)
5 SHIELD
R

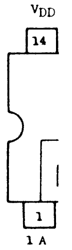
7.15 DF CIRCUIT BOARD


B
V.TRAP
V.PIN
B
H-LIN
G
R
MAS
V.PIN
V.TRAP
V.PIN
R
V. BOW
R B
H-SHIFT
V-SHIFT
V.AMP
B
H-SHIFT
V-SHIFT
G
H-SHIFT
V-SHIFT
V.AMP
R
H. BOW
R B
R G B
SKEW
SCAN SIZE
OVER
NOR
H.PIN
R MAS. B
R B
H. TRAP
V. LIN
MAS H. AMP
MAS H LIN
MAS.V.AMP
NTSC / PAL
B. H AMP
R H AMP
G. H. AMP
GND
TP1
TP2
B C E

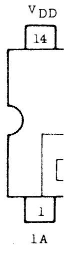
7.16-N COLOR ENCODER AND SSG BLOCK DIAGRAM (SE BOARD) -NTSC


CN5 (TO MT-1)
EXT VIDEO IN 2
GND 3
SW12V IN 6
EXT SYNC IN 7
RS H-PHASE IN 26
RM 9V IN 17
EXT/INT CTL 18
CF OUT 5
BGP OUT 23
V.RESET IN 15
SAMPLE P OUT 16
C.HD OUT 12
T.BL OUT 20
C.VD OUT 28
C.BL OUT 27
CP OUT 21
SYNC OUT 22
1/4fsc OUT 4
B IN 14
G IN 29
R IN 13
S4 INT. SC PHASE COARSE
Q3 PHASE SHIFT
R60 INT. SC PHASE FINE
Q1 PHASE SHIFT
Q2 PHASE SHIFT
Q4 PHASE SHIFT
Q5 BUFFER
S5 EXT. SC PHASE COARSE
R65 EXT. SC PHASE FINE
L.P.F
IC13-A
T1
IC2 SCV0486
GENLOCK IC
HA11247
HA11244
BRST-STOP
BRST-START
SYNC IN
H-PHASE
HD IN
REF-OC
SC CTL
H-CTL
INT (0°)
190°
Q6
Q7
H-ON
ON
R28 H-PHASE
R28
IC15
H:13 Pin
L:12 Pin
NOR
RM
EXT
INT
IST FILED
IC16
R73 SC LOCK
TP2
IC12
XTAL 2
C13 H-AFC
IC12-B
IC12-A
IC11-D
IC17
CLOCK
RESET
BARS OUT
C.BLACK
(TO IC1 29)
IC14
IC3
BUFFER
LEVEL SHIFT
IC1
EXT/INT
CFP OUT
SC OUT
BGP OUT
V-RESET IN
SPLIT/FULL
H-BL-W
V-BL-W
PILOT-P
C.HD
T.BL
D.VD
C.BL
CP
SYNC
1/4 fsc OUT
H-LOCK IN
VDD IN
S/R
VD/SP
4fsc IN
BFP
BARS OUT
H.D
I
W
Q
C.BARS SW
IC9
Q9 INV
Q11 BUFFER
Q10 INV
C3 SC FREQ.
IC11
X'TAL
TP7
SC CTL
S1 H.BL WIDTH
S2 V.BL WIDTH
S3
SPLIT
FULL
152T
154T
156T
18H
19H
20H
R147 BUST STOP
R148 BUST START
IC13-B
TO IC17
TO Q27
TO IC14-C
TO Q33
Q8 BUFFER
TO IC14
TO Q31, Q37
(TO IC1 12)
IC13-E
Q25
Q40 BUFFER
Q26 BUFFER
R116 QUADRATURE
(TO IC1 37)
IC14-C
TP8
TP9
TP10
IC6
SC TRAP
Q18
Q19 AMP
Q20 BUFFER
R118 Y LEVEL
C.BL
(TO IC1 29)
SYNC
(TO IC1 34)
R97 SYNC LEVEL
Q21 AMP
Q22 BUFFER
DL-1
CHROMA
TP6
Q32 BUFFER
Q38,39 AMP
Q24 BUFFER
B.P.F
R142 CHROMA LEVEL
HI-SENS
+18dB
-9dB
0dB
IC10-B
Q12,13 BUFFER
B SIG
(TO IC1 38)
Q27 AMP
(TO IC1 39)
Q33 AMP
IC10-A
Q14,15 BUFFER
G SIG
IC10-B
Q16,17 BUFFER
R SIG
IC4
IC5
I-SW
S6
L.P.F
Q28 AMP
DL-2
Q30 MIX. AMP
Q23 BUFFER
V-OUT
TP4
IC7
MODULATOR
SC
R150 BURST LEVEL
R160 BURST PHASE
Q31 CL AMP
R169 V-CARRIER BALANCE
CP
(TO IC1 32)
Q-SW
S7
Q34 AMP
Q35 MIX. AMP
Q36,41 BUFFER
Q-OUT
TP5
IC8
Q37 CL AMP
R156 U-GAIN
R168 U-CARRIER BALANCE
BARS
CN5 (TO MT-1)
1 GND
19 HI-SENS IN
8 VIDEO OUT
10 GND
11 BARS CTL
30 +9V IN
25 +7.2V IN
9 +5V IN
24 +3V IN

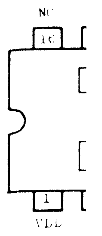
TC40H008P

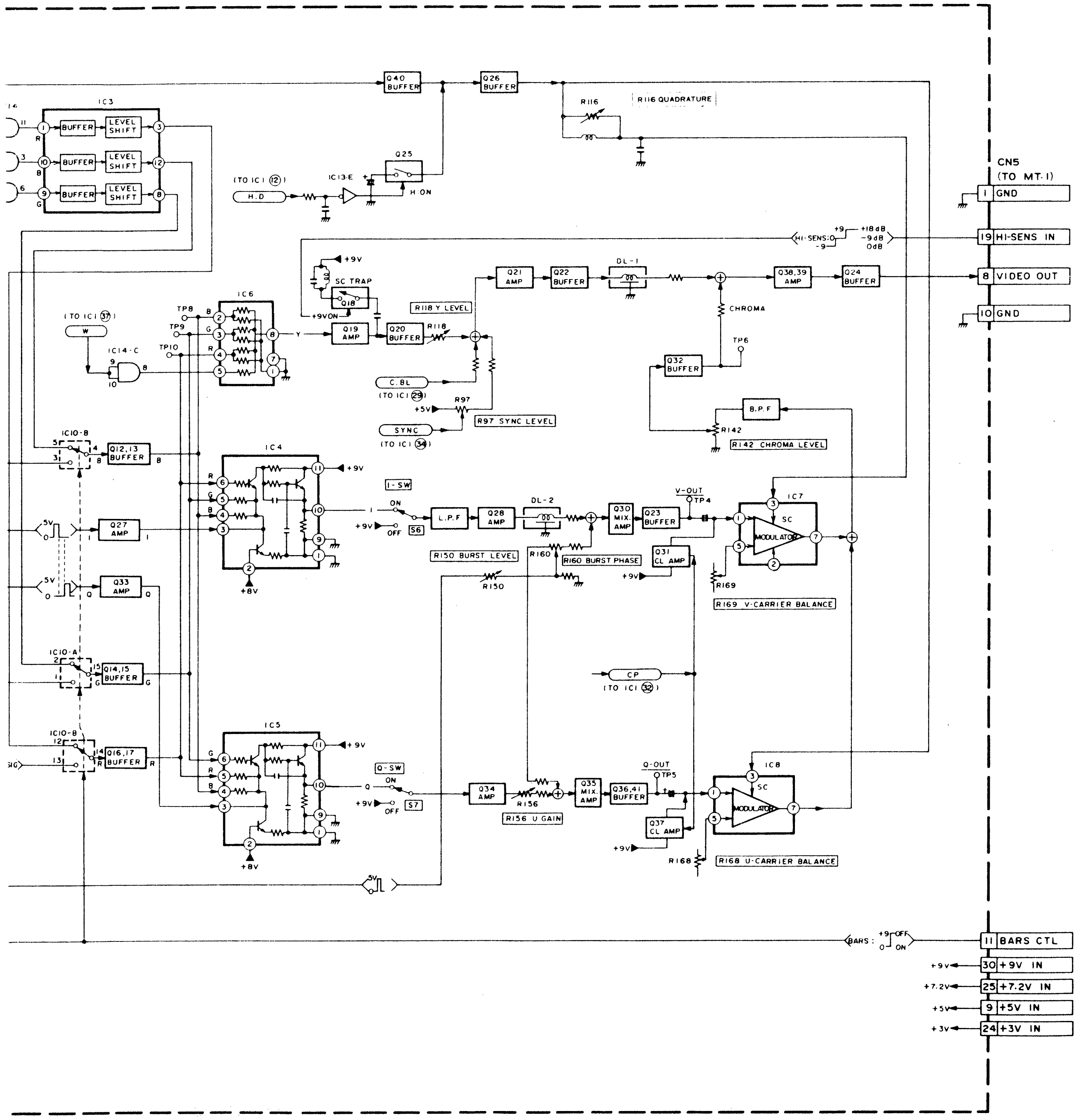


TC40H000P

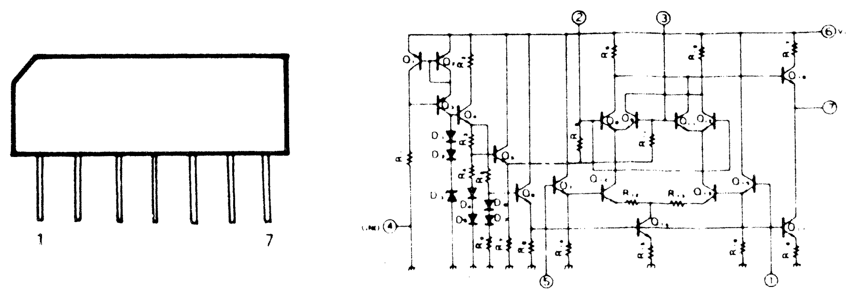


TC50H000P

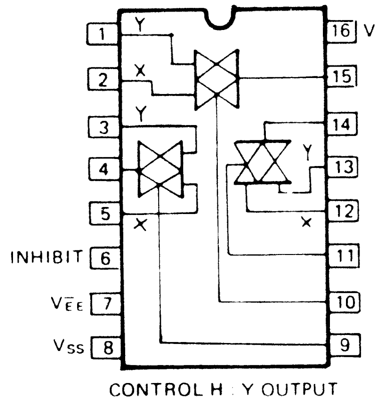



IC3
BUFFER
LEVEL SHIFT
R
B
G
Q40 BUFFER
Q26 BUFFER
R116
R116 QUADRATURE
Q25
(TO IC1 ⑫)
H.D
IC13-E
H:ON
CN5 (TO MT-1)
1 GND
19 HI-SENS IN
8 VIDEO OUT
10 GND
HI-SENS: 0 +9 -9
+18dB -9dB 0dB
+9V
SC TRAP
Q18
+9VON
Q21 AMP
Q22 BUFFER
DL-1
Q38,39 AMP
Q24 BUFFER
CHROMA
TP6
Q32 BUFFER
R118 Y LEVEL
Q19 AMP
Q20 BUFFER
R118
Y
IC6
TP8
TP9
TP10
(TO IC1 ㊲)
W
IC14-C
C.BL
(TO IC1 ㉙)
R97
+5V
R97 SYNC LEVEL
SYNC
(TO IC1 ㉞)
B.P.F
R142
R142 CHROMA LEVEL
IC10-B
Q12,13 BUFFER
IC4
+9V
I-SW
ON
OFF
S6
L.P.F
Q28 AMP
DL-2
Q30 MIX. AMP
Q23 BUFFER
V-OUT
TP4
IC7
SC
MODULATOR
Q27 AMP
Q33 AMP
5V
R150 BURST LEVEL
R160
R160 BURST PHASE
Q31 CL AMP
R150
R169
R169 V-CARRIER BALANCE
+8V
IC10-A
Q14,15 BUFFER
CP
(TO IC1 ㉜)
IC10-B
Q16,17 BUFFER
SIG
IC5
Q-SW
S7
Q34 AMP
R156
R156 U GAIN
Q35 MIX. AMP
Q36,41 BUFFER
Q-OUT
TP5
IC8
Q37 CL AMP
R168
R168 U-CARRIER BALANCE
BARS: +9 OFF 0 ON
11 BARS CTL
30 +9V IN
25 +7.2V IN
9 +5V IN
24 +3V IN
+9V
+7.2V
+5V
+3V

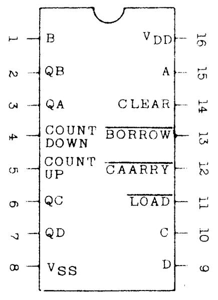
AN614 (Balance Modulator) [MATSUSHITA]



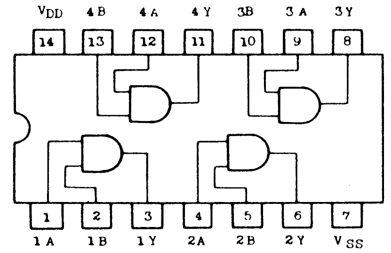
TC4053BF (Multiplexer/Demultiplexer) [TOSHIBA]


1
2
3
4
5
INHIBIT 6
VEE 7
VSS 8
16 VDD
15
14
13
12
11
10
9
Y
X
CONTROL H Y OUTPUT

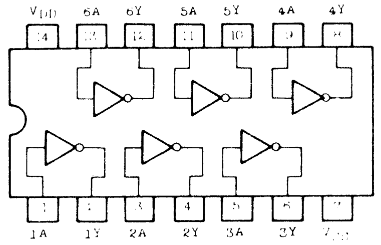
TC40H193F (Four-bit Binary Up/Dowun Counter) [TOSHIBA]


1 B
2 QB
3 QA
4 COUNT DOWN
5 COUNT UP
6 QC
7 QD
8 VSS
16 VDD
15 A
14 CLEAR
13 BORROW
12 CAARRY
11 LOAD
10 C
9 D

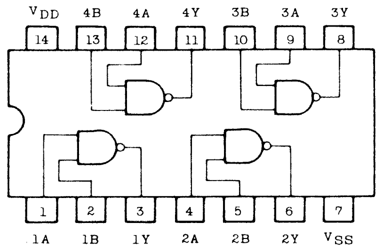
TC40H008F (Quad 2-Input and Gate) [TOSHIBA]


VDD 4B 4A 4Y 3B 3A 3Y
14 13 12 11 10 9 8
1 2 3 4 5 6 7
1A 1B 1Y 2A 2B 2Y VSS

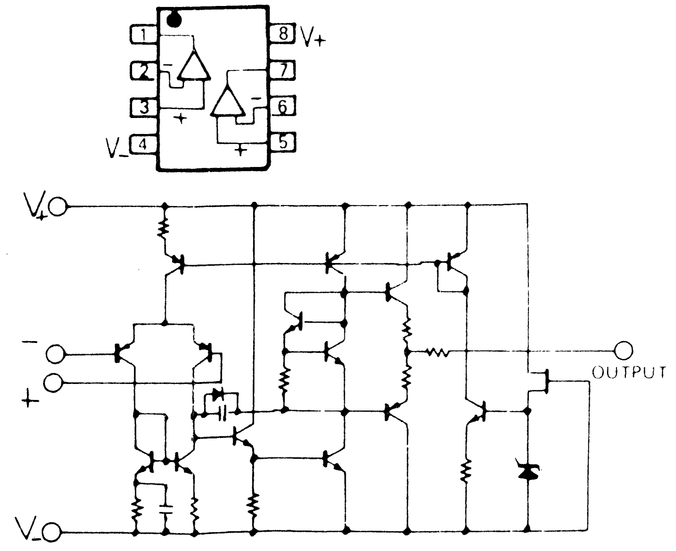
TC40H004F (Hex Invertor) [TOSHIBA]


VDD 6A 6Y 5A 5Y 4A 4Y
1A 1Y 2A 2Y 3A 3Y

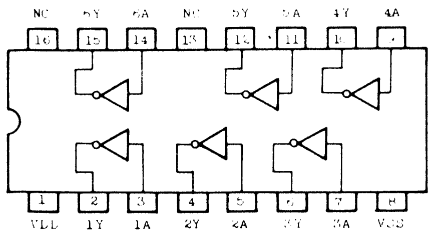
TC40H000F (Quad Two Input NAND Gate) [TOSHIBA]


VDD 4B 4A 4Y 3B 3A 3Y
14 13 12 11 10 9 8
1 2 3 4 5 6 7
1A 1B 1Y 2A 2B 2Y VSS

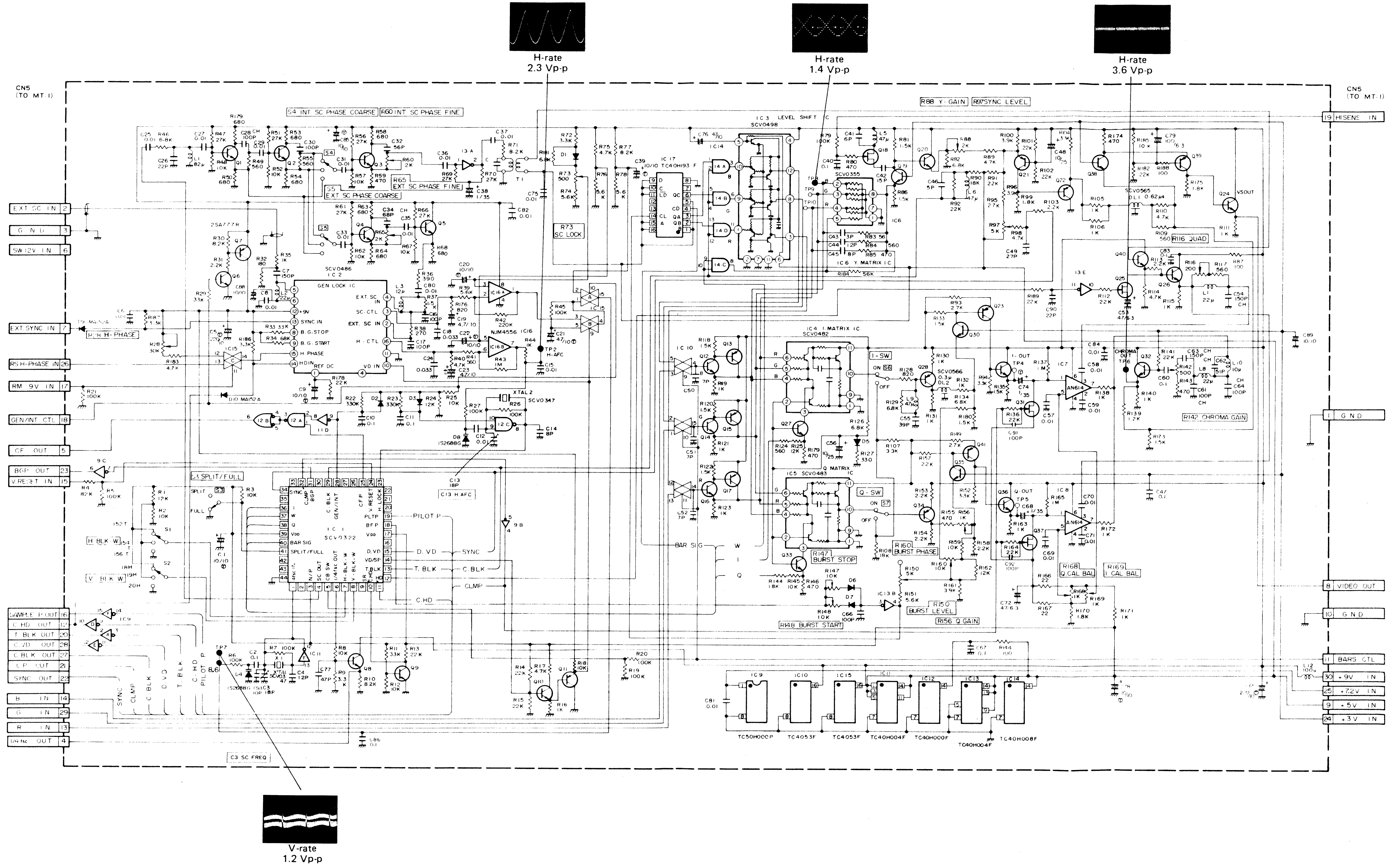
NJM4560M (Dual OP. Amp) [JRC]


1
2
3
V- 4
8 V+
7
6
5
V+
-
+
OUTPUT
V-

TC50H000P (Hex Buffer/Converter) [TOSHIBA]


NC 6Y 6A NC 5Y 5A 4Y 4A
16 15 14 13 12 11
1 2 3 4 5 6 7 8
VDD 1Y 1A 2Y 2A 3Y 3A VSS

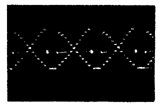
7.17-N SE BOARD SCHEMATIC DIAGRAM -NTSC

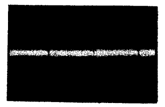

H-rate
2.3 Vp-p
H-rate
1.4 Vp-p
H-rate
3.6 Vp-p
V-rate
1.2 Vp-p
CN5 (TO MT I)
CN5 (TO MT-I)
S4 INT SC PHASE COARSE
R60 INT SC PHASE FINE
S5 EXT SC PHASE COARSE
R65 EXT SC PHASE FINE
R73 SC LOCK
R88 Y-GAIN
R97 SYNC LEVEL
R116 QUAD
R142 CHROMA GAIN
R147 BURST STOP
R148 BURST START
R150 BURST LEVEL
R156 Q GAIN
R160 BURST PHASE
R168 Q CAL BAL
R169 I CAL BAL
R7 H-PHASE
C13 H AFC
C3 SC FREQ
S3 SPLIT/FULL
EXT SC IN 2
GND 3
SW 12V IN 6
EXT SYNC IN 7
RS H-PHASE IN 26
RM 9V IN 17
GEN/INT CTL 18
CF OUT 5
BGP OUT 23
V.RESET IN 15
H BLK W
V BLK W
SAMPLE P OUT 16
C.HD OUT 12
T.BLK OUT 20
C.VD OUT 28
C.BLK OUT 27
CP OUT 21
SYNC OUT 22
B IN 14
G IN 29
R IN 13
1/4fsc OUT 4
19 HISENS IN
1 GND
8 VIDEO OUT
10 GND
11 BARS CTL
30 +9V IN
25 +7.2V IN
9 +5V IN
24 +3V IN
IC2 SCV0486 GEN LOCK IC
IC1 SCV0322
IC16 NJM4556
IC17 TC40H193F
IC3 LEVEL SHIFT IC SCV0498
IC6 Y MATRIX IC SCV0355
IC4 I MATRIX IC SCV0482
IC5 Q MATRIX SCV0483
IC7 AN614
IC8 AN614
I-SW
Q-SW
I-OUT TP4
Q-OUT TP5
CHROMA OUT TP6
TP2 H-AFC
TP7
XTAL 2 SCV0347
BAR SIG
PILOT P
SYNC
C.BLK
CLMP
C.HD
D.VD
T.BLK
VSOUT
IC9 TC50H000P
IC10 TC4053F
IC15 TC4053F
IC21 TC40H004F
IC12 TC40H000F
IC13 TC40H004F
IC14 TC40H008F

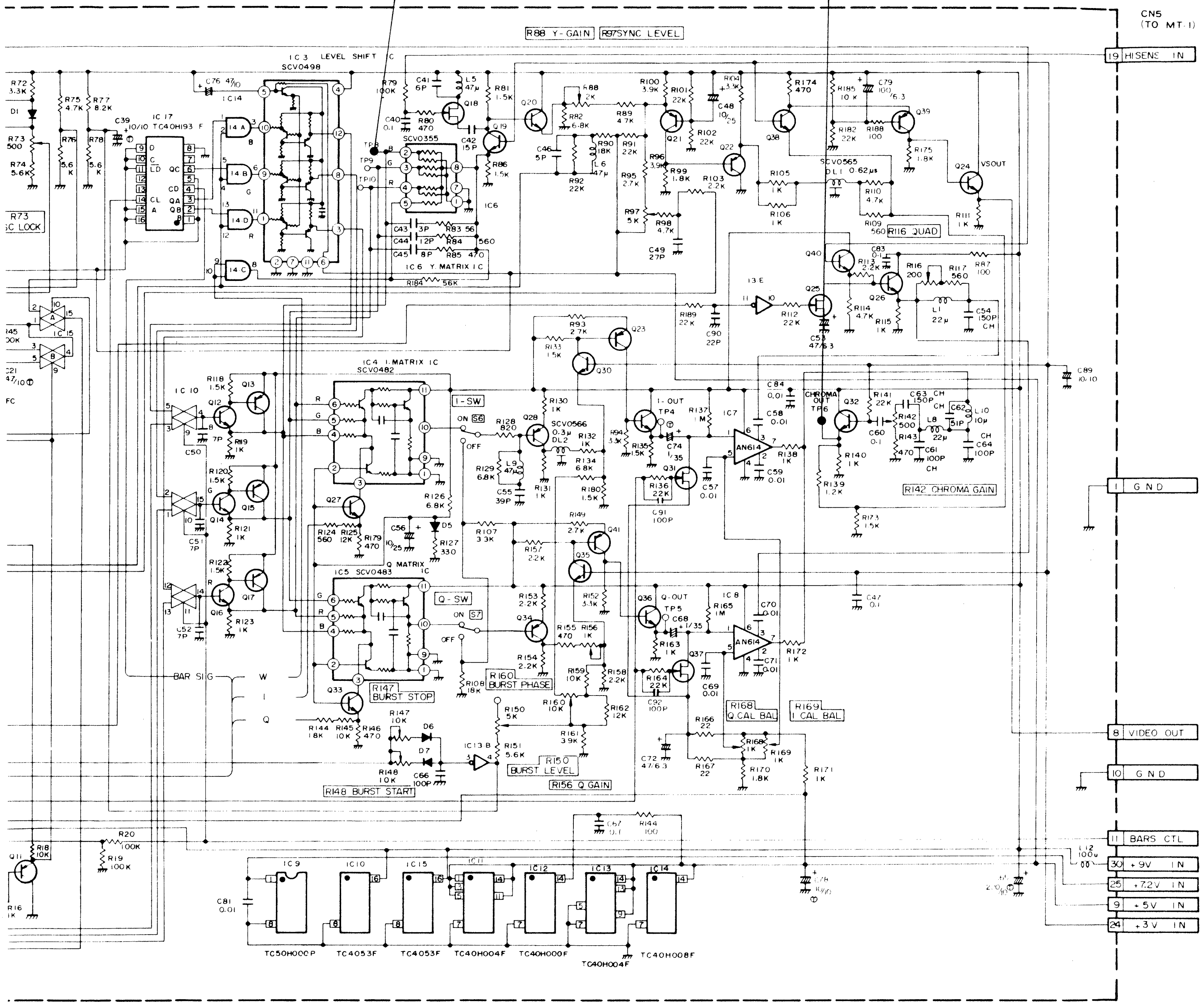
Q SW. —
I SW. —
Q.GAIN —
BURST LE
BURST PH
QUAD. —
V-BLK-WID
H-BLK-WID
H. AF
SC FREQUE
SPLIT FULL

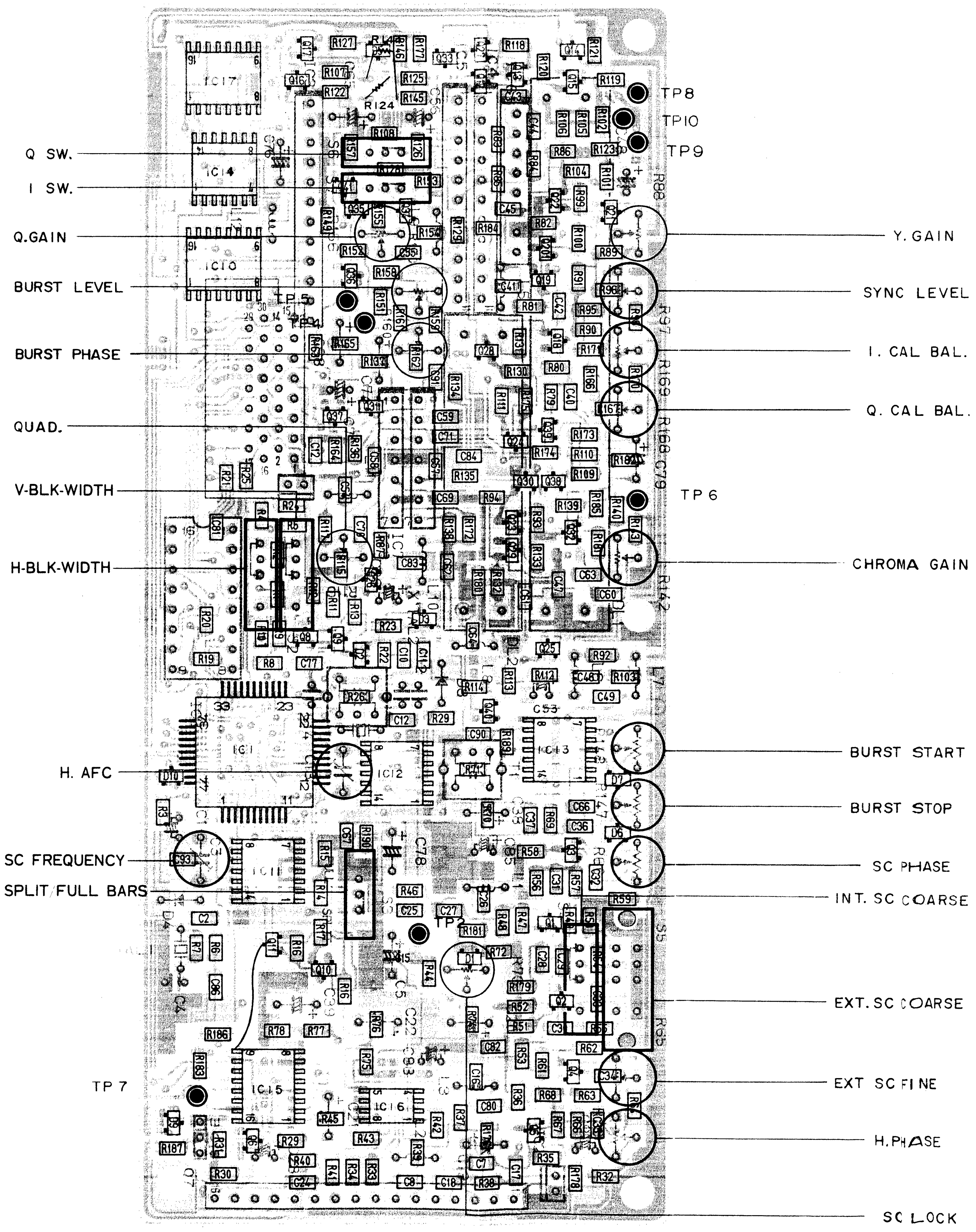
7.18-N SE CIRCUIT BOARD -NTSC

e
-p

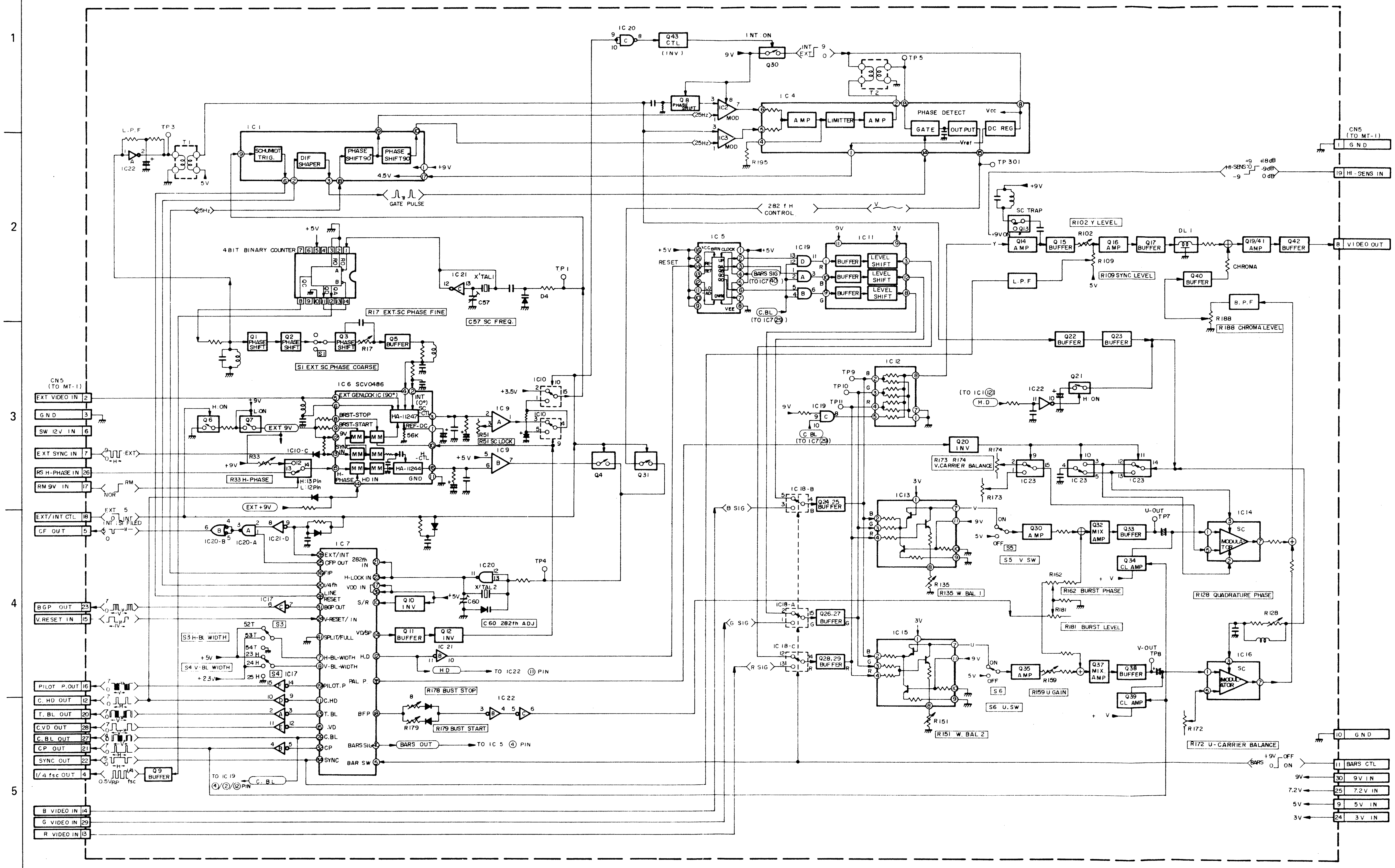

H-rate
1.4 Vp-p


H-rate
3.6 Vp-p


CN5
(TO MT-1)
19 HISENS IN
R88 Y-GAIN
R97 SYNC LEVEL
IC3 LEVEL SHIFT IC
SCV0498
IC17 TC40H193F
SC LOCK
IC6 Y MATRIX IC
R116 QUAD
VSOUT
IC4 I MATRIX IC
SCV0482
I-SW
I-OUT
TP4
IC7
AN614
CHROMA OUT
TP6
R142 CHROMA GAIN
1 GND
IC5 SCV0483
Q MATRIX IC
Q-SW
Q-OUT
TP5
IC8
AN614
R160 BURST PHASE
R147 BURST STOP
R148 BURST START
R150 BURST LEVEL
R156 Q GAIN
R168 Q CAL BAL
R169 I CAL BAL
BAR SIG
W
I
Q
8 VIDEO OUT
10 GND
11 BARS CTL
30 +9V IN
25 +7.2V IN
9 +5V IN
24 +3V IN
IC9
IC10
IC15
IC11
IC12
IC13
IC14
TC50H000P
TC4053F
TC4053F
TC40H004F
TC40H000F
TC40H004F
TC40H008F

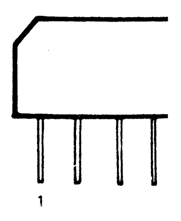

Q SW.
I SW.
Q.GAIN
BURST LEVEL
BURST PHASE
QUAD.
V-BLK-WIDTH
H-BLK-WIDTH
H. AFC
SC FREQUENCY
SPLIT/FULL BARS
TP 7
TP8
TP10
TP9
Y. GAIN
SYNC LEVEL
I. CAL BAL.
Q. CAL BAL.
TP 6
CHROMA GAIN
BURST START
BURST STOP
SC PHASE
INT. SC COARSE
EXT. SC COARSE
EXT SC FINE
H. PHASE
SC LOCK
IC17
IC14
IC10
IC1
IC12
IC13
IC11
IC15
IC16
TP5
TP2

7.16-P COLOR ENCODER AND SSG BLOCK DIAGRAM (SE BOARD) -PAL

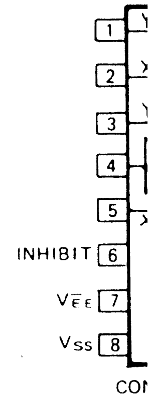


IC20
Q43 CTL (INV)
INT ON
Q30
TP5
T2
IC4
Q8 PHASE SHIFT
IC2 MOD
IC3 MOD
AMP
LIMITTER
PHASE DETECT
GATE
OUT PUT
DC REG
Vref
R195
TP301
L.P.F
TP3
T1
IC22
IC1
SCHUMIDT TRIG.
DIF SHAPER
PHASE SHIFT90
GATE PULSE
25Hz
282 f H CONTROL
4BIT BINARY COUNTER
IC21
X'TAL1
C57 SC FREQ.
TP1
D4
R17 EXT.SC PHASE FINE
Q1 PHASE SHIFT
Q2 PHASE SHIFT
Q3 PHASE SHIFT
Q5 BUFFER
S1 EXT SC PHASE COARSE
IC6 SCV0486
EXT GENLOCK IC (90°)
INT (0°) SC CTL
BRST-STOP
BRST-START
HA-11247
REF-DC
HA-11244
H-PHASE
HD IN
GND
R51 SC LOCK
IC9
IC10
Q4
Q31
Q6 H-ON
Q7 L-ON
EXT 9V
IC10-C
R33 H-PHASE
Q12
H:13 Pin
L:12 Pin
EXT +9V
CN5 (TO MT-1)
EXT VIDEO IN 2
GND 3
SW 12V IN 6
EXT SYNC IN 7
RS H-PHASE IN 26
RM 9V IN 17
EXT/INT CTL 18
CF OUT 5
BGP OUT 23
V.RESET IN 15
PILOT P.OUT 16
C.HD OUT 12
T.BL OUT 20
C.VD OUT 28
C.BL OUT 27
CP OUT 21
SYNC OUT 22
1/4 fsc OUT 4
B VIDEO IN 14
G VIDEO IN 29
R VIDEO IN 13
IC20-B
IC20-A
IC21-D
IC7
EXT/INT
CFP OUT
FIP
1/4fh
LINE RESET
BGP OUT
V-RESET/IN
SPLIT/FULL
H-BL-WIDTH
V-BL-WIDTH
PILOT.P
C.HD
T.BL
.VD
C.BL
CP
SYNC
282fh IN
H-LOCK IN
VDD IN
S/R
VD/SP
H.D
PAL P
BFP
BARS SIG
BAR SW
IC17
S3 H-BL WIDTH
S4 V-BL WIDTH
Q9 BUFFER
0.5Vpp
TO IC19 ④②⑫PIN
C.BL
Q10 INV
Q11 BUFFER
Q12 INV
X'TAL2
C60 282fh ADJ
TP4
R178 BUST STOP
R179 BUST START
BARS OUT
TO IC5 ④ PIN
TO IC22 ⑪ PIN
IC5
RESET
BARS SIG (TO IC7⑭)
C.BL (TO IC7㉙)
IC19
IC11
BUFFER
LEVEL SHIFT
IC12
TP9
TP10
TP11
C.BL (TO IC7㉙)
IC18-B
IC18-A
IC18-C
Q24,25 BUFFER
Q26,27 BUFFER
Q28,29 BUFFER
B SIG
G SIG
R SIG
IC13
IC15
R135 W.BAL 1
R151 W.BAL 2
S5 V SW
S6 U.SW
Q30 AMP
Q35 AMP
Q32 MIX AMP
Q37 MIX AMP
Q33 BUFFER
Q38 BUFFER
Q34 CL AMP
Q39 CL AMP
U-OUT TP7
V-OUT TP8
R159 U GAIN
R162 BURST PHASE
R181 BURST LEVEL
IC14 MODULATOR
IC16 MODULATOR
R128 QUADRATURE PHASE
R172 U-CARRIER BALANCE
Q20 INV
R173 R174 V.CARRIER BALANCE
IC23
(TO IC1⑫)
IC22
Q21 H ON
Q22 BUFFER
Q23 BUFFER
SC TRAP
Q13
Q14 AMP
Q15 BUFFER
R102 Y LEVEL
Q16 AMP
Q17 BUFFER
DL1
Q19/41 AMP
Q42 BUFFER
R109 SYNC LEVEL
Q40 BUFFER
CHROMA
B.P.F
R188 CHROMA LEVEL
HI-SENS
+18dB
-9dB
0dB
CN5 (TO MT-1)
1 GND
19 HI-SENS IN
8 VIDEO OUT
10 GND
11 BARS CTL
30 9V IN
25 7.2V IN
9 5V IN
24 3V IN
BARS
ON
OFF

AN614 (Balance M

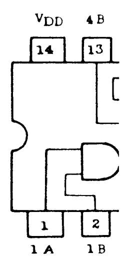


TC4053BF (Multip



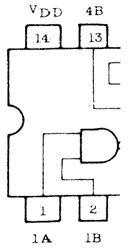
1
2
3
4
5
INHIBIT 6
VEE 7
VSS 8
CON

TC40H008F (Qua



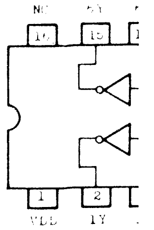
VDD
4B
14
13
1
2
1A
1B

TC40H000F (Qua

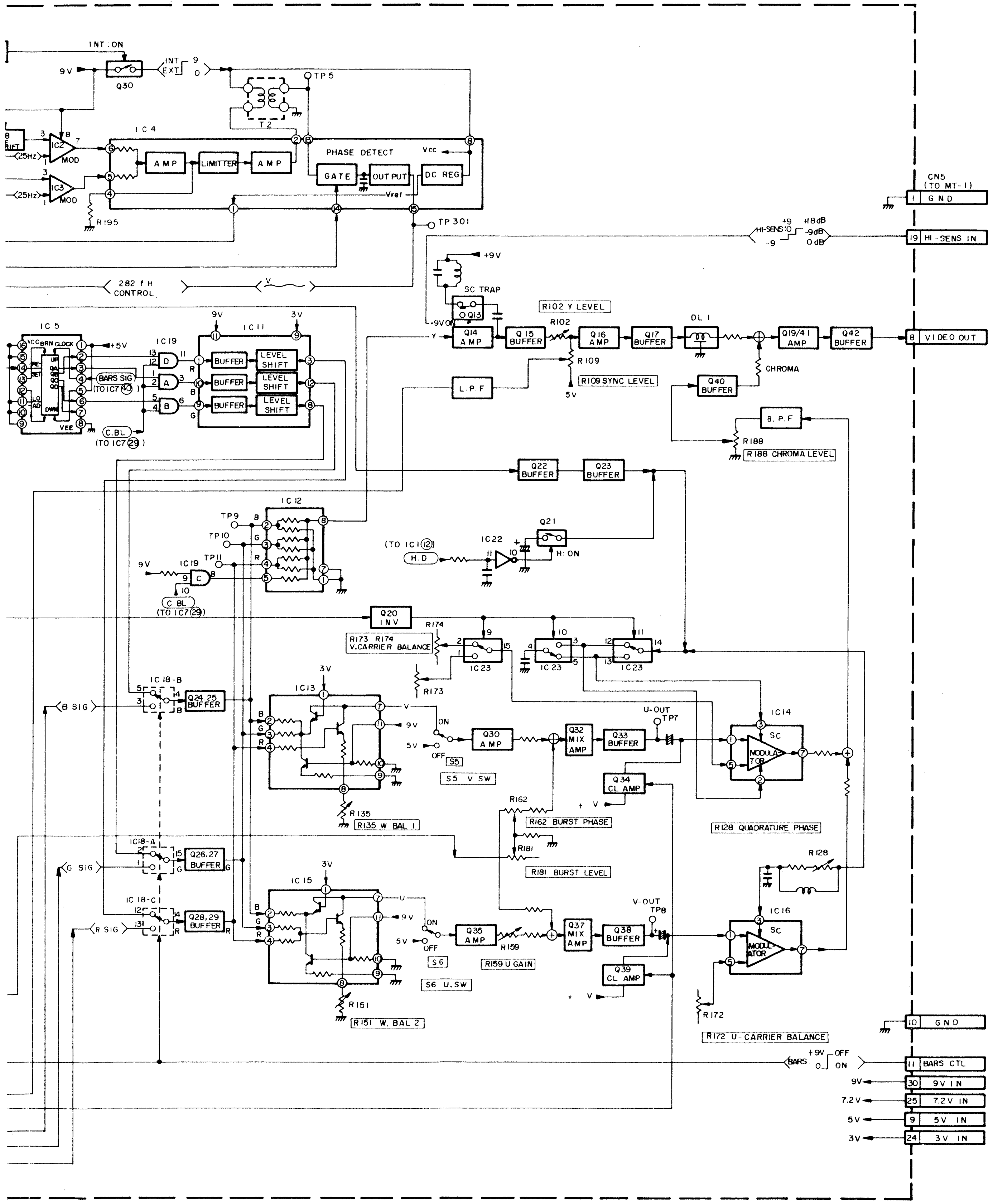


VDD
4B
14
13
1
2
1A
1B

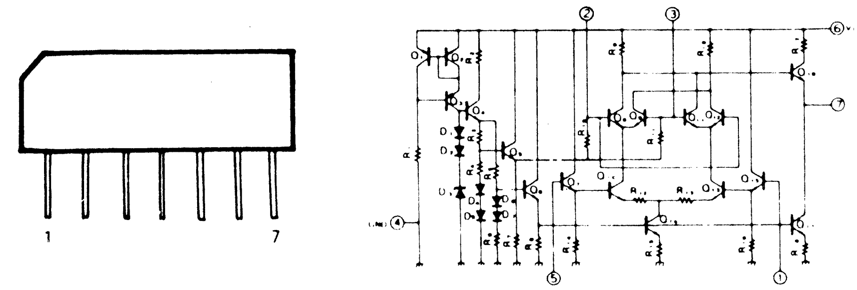
TC50H000P (Hex



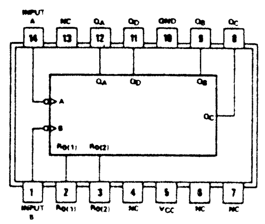
14
13
1
2
VDD
1Y


INT ON
9V
Q30
INT
EXT
TP5
T2
IC4
IC2
MOD
IC3
25Hz
AMP
LIMITTER
PHASE DETECT
GATE
OUT PUT
DC REG
Vcc
Vref
R195
TP 301
CN5
(TO MT-1)
GND
HI-SENS IN
+9 +8dB
-9 -9dB
0dB
282 f H
CONTROL
+9V
SC TRAP
Q14 AMP
Q15 BUFFER
R102 Y LEVEL
R102
Q16 AMP
Q17 BUFFER
DL 1
Q19/41 AMP
Q42 BUFFER
VIDEO OUT
R109
R109 SYNC LEVEL
L.P.F
Q40 BUFFER
CHROMA
B.P.F
R188
R188 CHROMA LEVEL
IC5
IC19
IC11
BUFFER
LEVEL SHIFT
BARS SIG
(TO IC7)
C.BL
(TO IC7)
Q22 BUFFER
Q23 BUFFER
IC12
TP9
TP10
TP11
IC22
Q21
H ON
(TO IC1)
H.D
Q20 INV
R174
R173 R174 V.CARRIER BALANCE
IC23
R173
IC18-B
B SIG
Q24.25 BUFFER
IC13
3V
9V
5V
ON
OFF
S5
S5 V SW
Q30 AMP
Q32 MIX AMP
Q33 BUFFER
U-OUT
TP7
IC14
SC
MODULATOR
Q34 CL AMP
R135
R135 W BAL 1
R162
R162 BURST PHASE
R181
R181 BURST LEVEL
R128 QUADRATURE PHASE
R128
IC18-A
G SIG
Q26.27 BUFFER
IC18-C
R SIG
Q28.29 BUFFER
IC15
U
S6
S6 U.SW
Q35 AMP
R159
R159 U GAIN
Q37 MIX AMP
Q38 BUFFER
V-OUT
TP8
IC16
Q39 CL AMP
R151
R151 W.BAL 2
R172
R172 U-CARRIER BALANCE
GND
+9V OFF
BARS ON
BARS CTL
9V IN
7.2V IN
5V IN
3V IN
7.2V
5V
3V

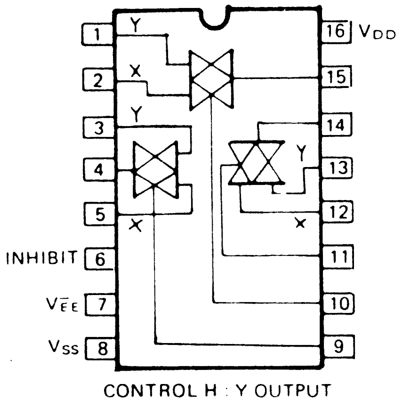
AN614 (Balance Modulator) [MATSUSHITA]



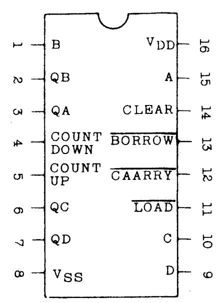
SN74LS93
4-BIT BINARY COUNTERS


INPUT A
QA
QD
GND
QB
QC
INPUT B
R0(1)
R0(2)
VCC

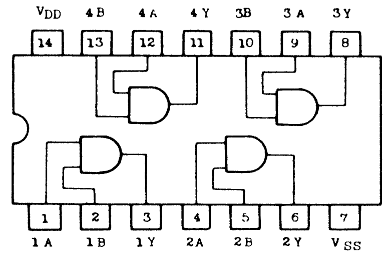
TC4053BF (Multiplexer/Demultiplexer) [TOSHIBA]


1
2
3
4
5
INHIBIT 6
VEE 7
VSS 8
16 VDD
15
14
13
12
11
10
9
X
Y
CONTROL H : Y OUTPUT

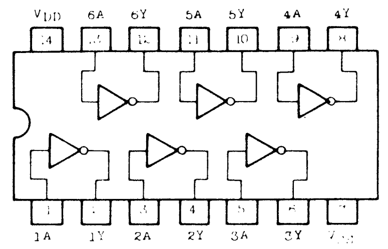
TC40H193F (Four-bit Binary Up/Dowun Counter) [TOSHIBA]


1 B
2 QB
3 QA
4 COUNT DOWN
5 COUNT UP
6 QC
7 QD
8 VSS
16 VDD
15 A
14 CLEAR
13 BORROW
12 CAARRY
11 LOAD
10 C
9 D

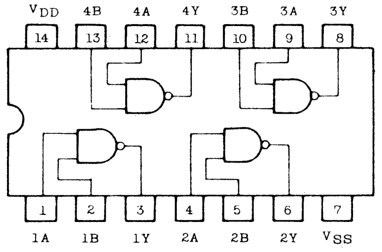
TC40H008F (Quad 2-Input and Gate) [TOSHIBA]


VDD 4B 4A 4Y 3B 3A 3Y
14 13 12 11 10 9 8
1 2 3 4 5 6 7
1A 1B 1Y 2A 2B 2Y VSS

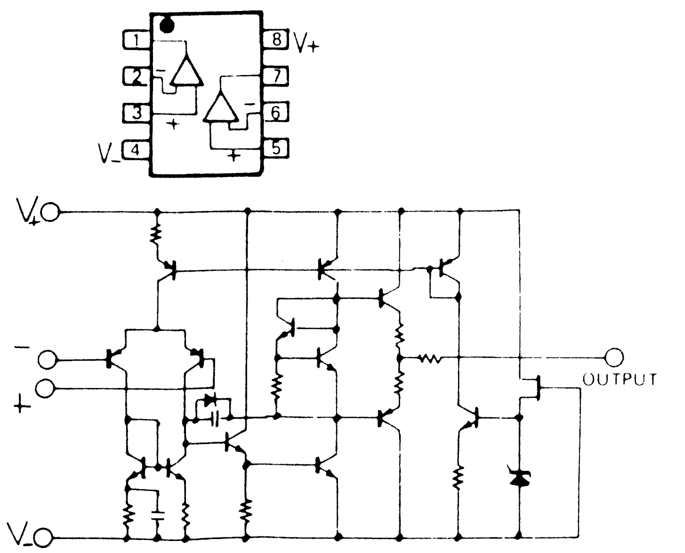
TC40H004F (Hex Invertor) [TOSHIBA]


VDD 6A 6Y 5A 5Y 4A 4Y
1A 1Y 2A 2Y 3A 3Y

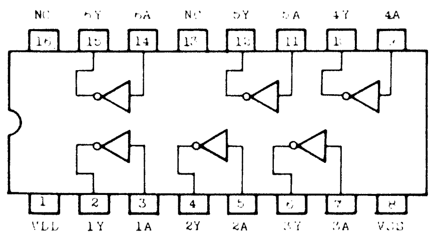
TC40H000F (Quad Two Input NAND Gate) [TOSHIBA]


VDD 4B 4A 4Y 3B 3A 3Y
14 13 12 11 10 9 8
1 2 3 4 5 6 7
1A 1B 1Y 2A 2B 2Y VSS

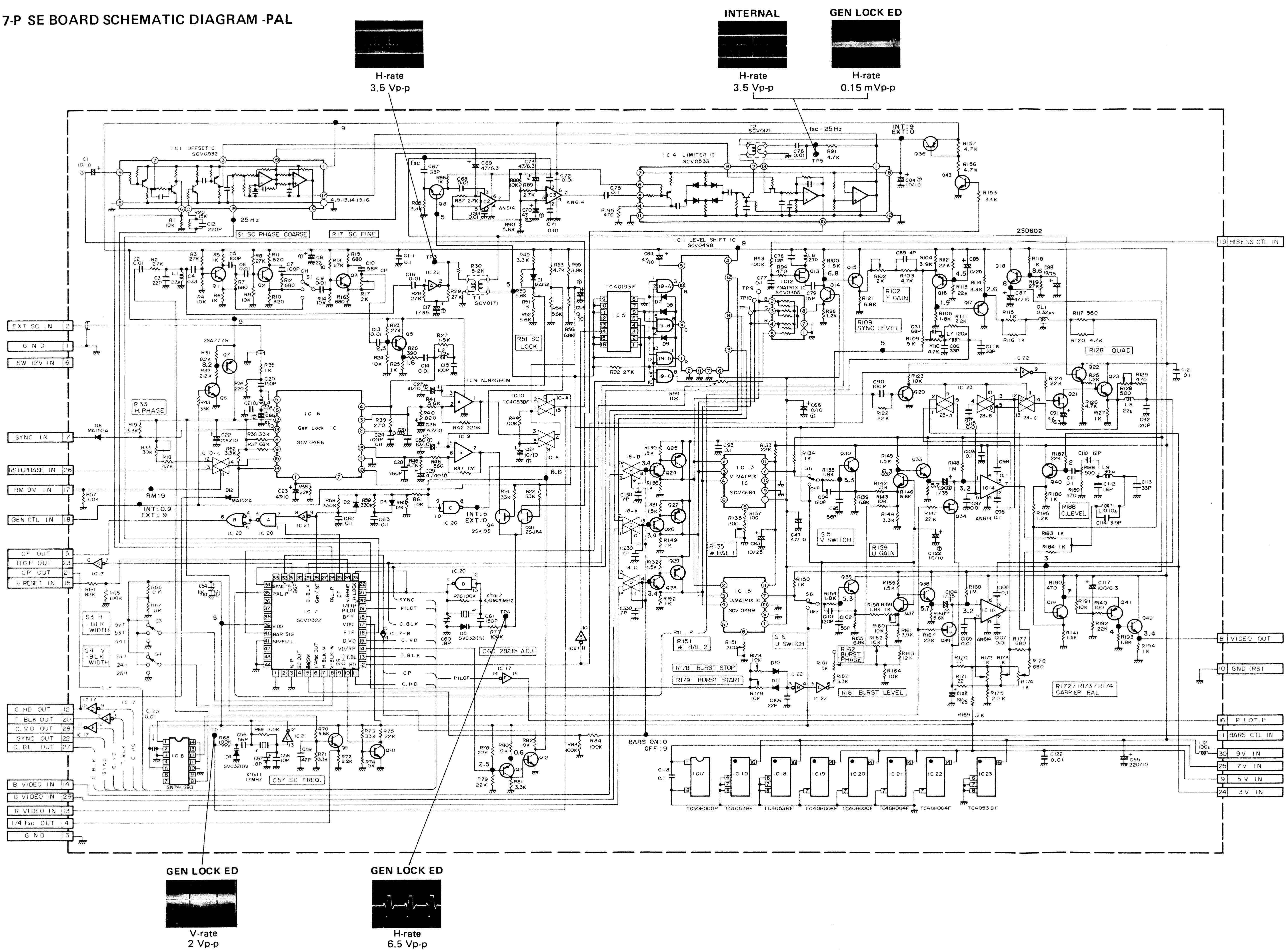
NJM4560M (Dual OP. Amp) [JRC]


1
2
3
V- 4
8 V+
7
6
5
V+
-
+
V-
OUTPUT

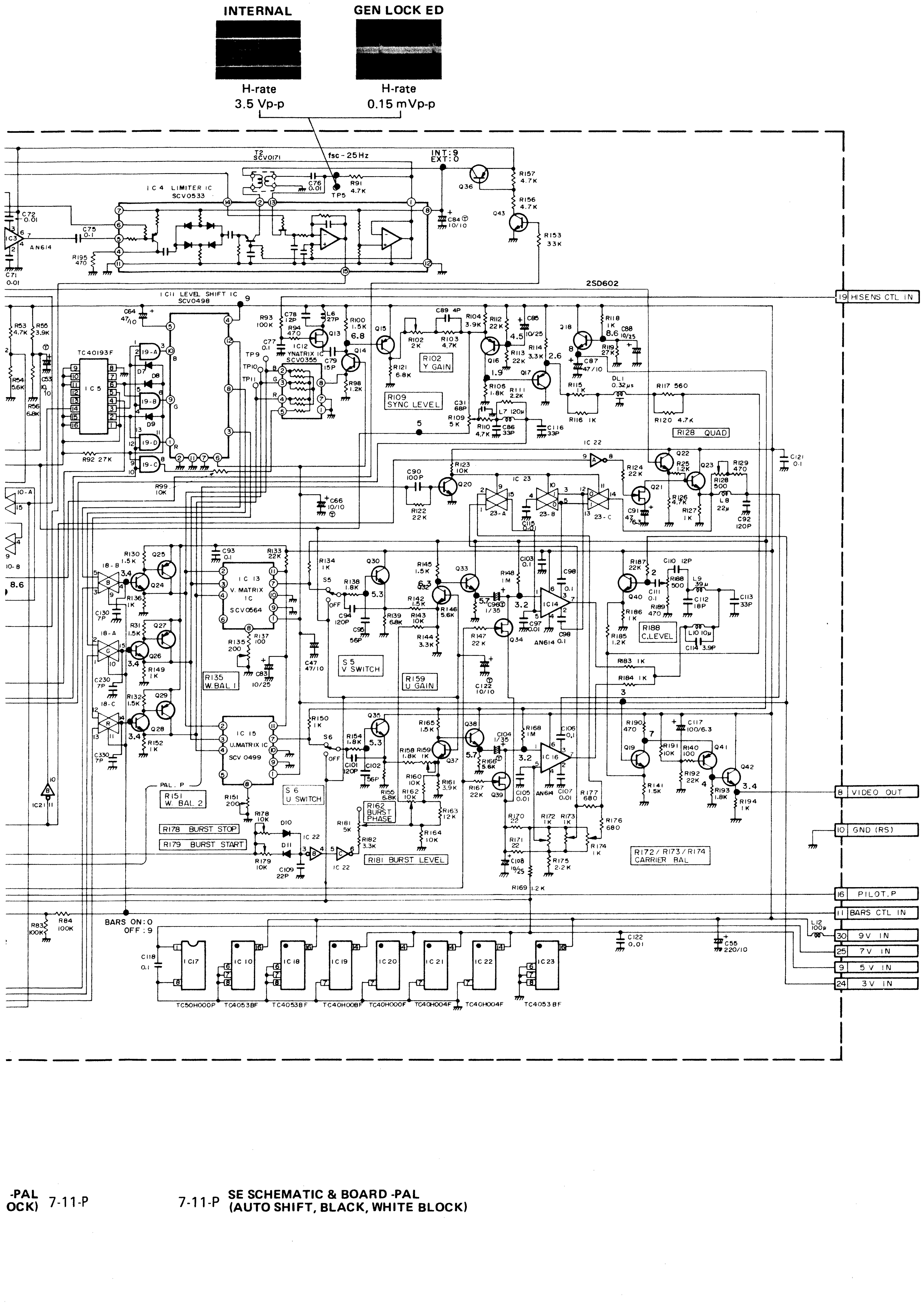
TC50H000P (Hex Buffer/Converter) [TOSHIBA]


NC 6Y 6A NC 5Y 5A 4Y 4A
1 2 3 4 5 6 7 8
VDD 1Y 1A 2Y 2A 3Y 3A VSS

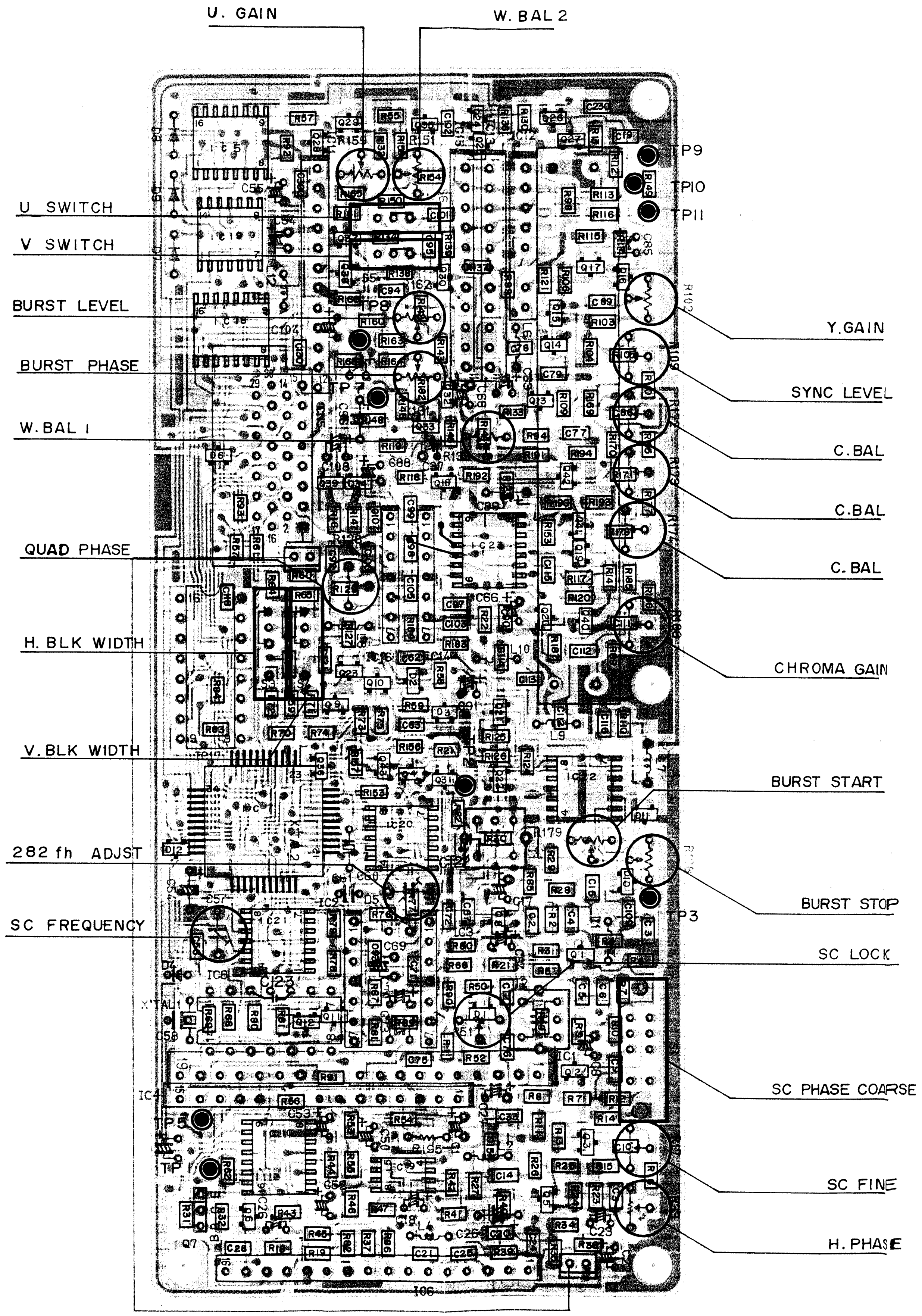
7.17-P SE BOARD SCHEMATIC DIAGRAM -PAL



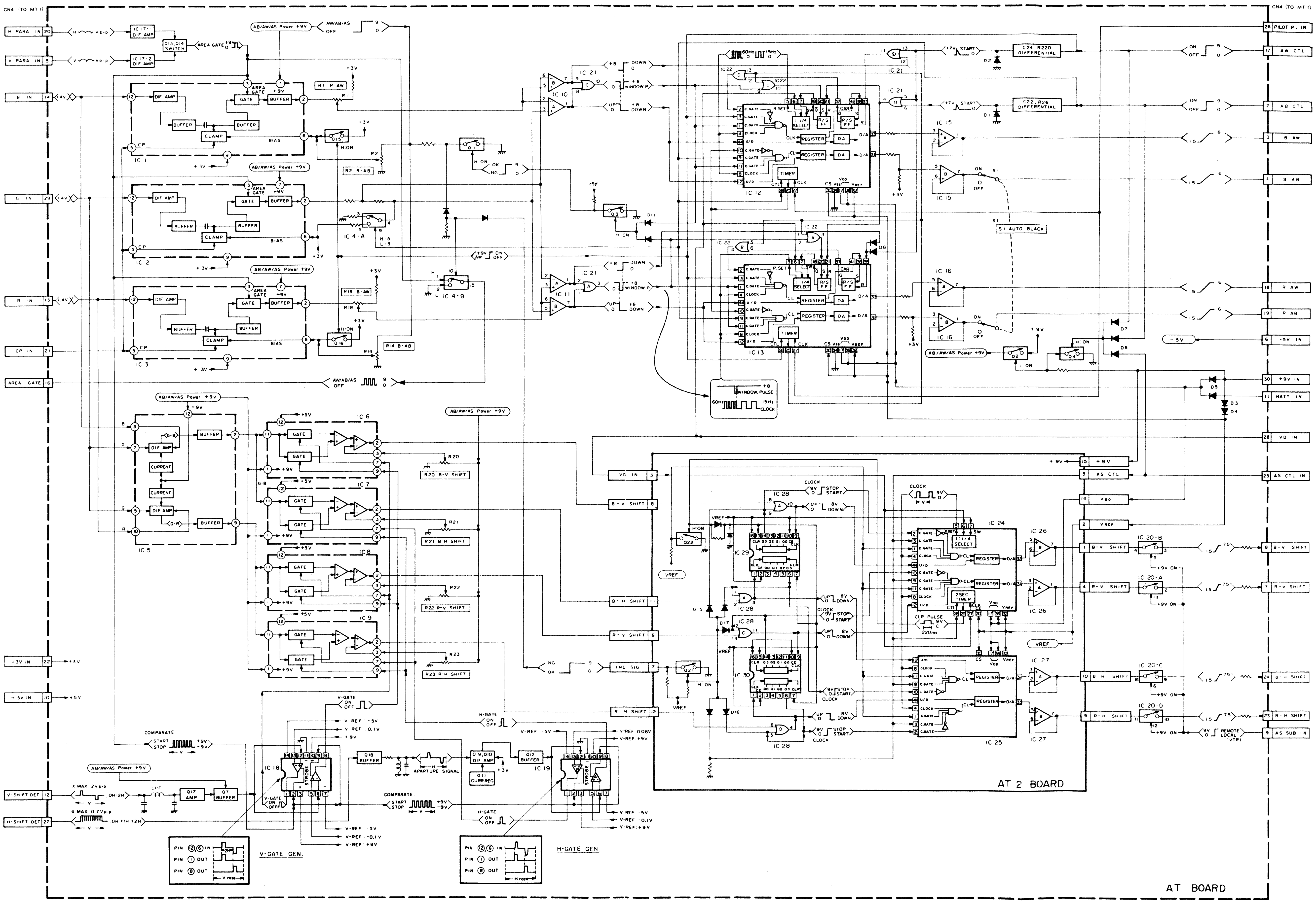
A
B
C
D
E
F
G
H
1
2
3
4
5
6
H-rate
3.5 Vp-p
INTERNAL
H-rate
3.5 Vp-p
GEN LOCK ED
H-rate
0.15 mVp-p
IC1 OFFSETIC SCV0532
IC4 LIMITER IC SCV0533
IC11 LEVEL SHIFT IC SCV0498
IC6 Gen Lock IC SCV 0486
IC7 SCV0322
IC9 NJM4560M
IC10 TC4053BF
IC13 V.MATRIX IC SCV0564
IC15 U.MATRIX IC SCV 0499
IC12 YMATRIX IC SCV0355
IC8 SN74LS93
IC14 AN614
IC16 AN614
S1 SC PHASE COARSE
R17 SC FINE
R51 SC LOCK
R33 H.PHASE
R102 Y GAIN
R109 SYNC LEVEL
R128 QUAD
R188 C.LEVEL
S5 V SWITCH
R159 U GAIN
R135 W.BAL 1
R151 W.BAL 2
S6 U SWITCH
R162 BURST PHASE
R178 BURST STOP
R179 BURST START
R181 BURST LEVEL
R172/R173/R174 CARRIER BAL
C60 282fh ADJ
C57 SC FREQ.
S3 H BLK WIDTH
S4 V BLK WIDTH
RM:9
INT:0.9
EXT:9
INT:5
EXT:0
INT:9
EXT:0
BARS ON:0
OFF:9
fsc-25Hz
25Hz
EXT SC IN 2
GND 1
SW 12V IN 6
SYNC IN 7
RSH.PHASE IN 26
RM 9V IN 17
GEN CTL IN 18
CF OUT 5
BGP OUT 23
CP OUT 21
V.RESET IN 15
C.HD OUT 12
T.BLK OUT 20
C.VD OUT 28
SYNC OUT 22
C.BL OUT 27
B VIDEO IN 14
G VIDEO IN 29
R VIDEO IN 13
1/4 fsc OUT 4
GND 3
19 HISENS CTL IN
8 VIDEO OUT
10 GND (RS)
16 PILOT.P
11 BARS CTL IN
30 9V IN
25 7V IN
9 5V IN
24 3V IN
TC50H000P
TC4053BF
TC4053BF
TC40H000F
TC40H000F
TC40H004F
TC40H004F
TC4053BF
GEN LOCK ED
V-rate
2 Vp-p
GEN LOCK ED
H-rate
6.5 Vp-p


INTERNAL
GEN LOCK ED
H-rate
3.5 Vp-p
H-rate
0.15 mVp-p
IC4 LIMITER IC SCV0533
T2 SCV0171
fsc-25Hz
TP5
INT:9
EXT:0
IC11 LEVEL SHIFT IC SCV0498
2SD602
IC12 Y.MATRIX IC SCV0355
R102 Y GAIN
R109 SYNC LEVEL
R128 QUAD
IC22
IC23
IC5 TC40193F
IC13 V. MATRIX IC SCV0564
IC15 U.MATRIX IC SCV 0499
IC14 AN614
IC16 AN614
S5 V SWITCH
S6 U SWITCH
R135 W.BAL 1
R151 W. BAL 2
R159 U GAIN
R188 C.LEVEL
R162 BURST PHASE
R181 BURST LEVEL
R178 BURST STOP
R179 BURST START
R172/R173/R174 CARRIER BAL
19 HISENS CTL IN
8 VIDEO OUT
10 GND (RS)
16 PILOT.P
11 BARS CTL IN
30 9V IN
25 7V IN
9 5V IN
24 3V IN
BARS ON:0
OFF:9
PAL.P
IC17 IC10 IC18 IC19 IC20 IC21 IC22 IC23
TC50H000P TC4053BF TC4053BF TC40H008F TC40H000F TC40H004F TC40H004F TC4053BF

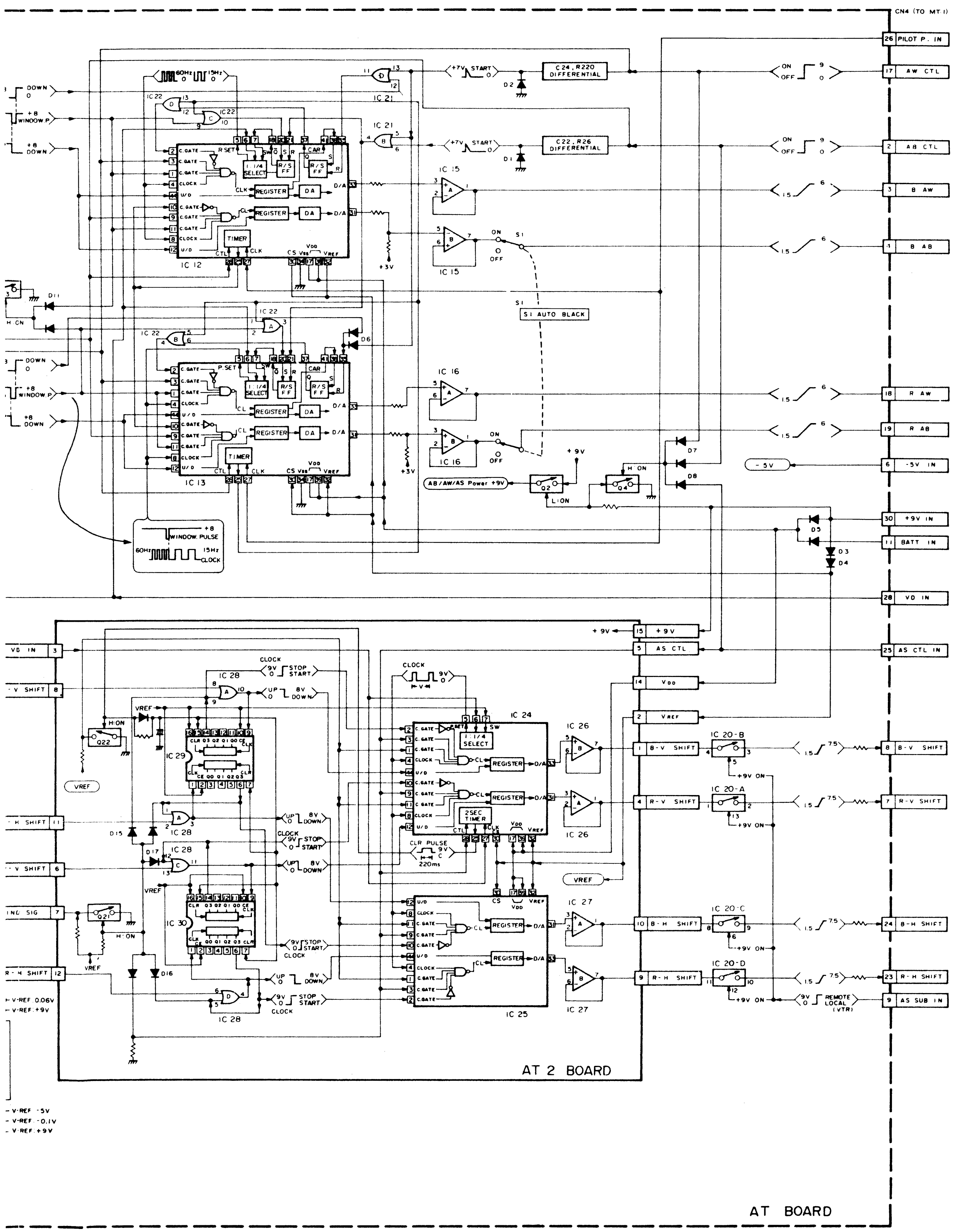
7.18-P SE CIRCUIT BOARD -PAL


U. GAIN
W. BAL 2
U SWITCH
V SWITCH
BURST LEVEL
BURST PHASE
W. BAL 1
QUAD PHASE
H. BLK WIDTH
V. BLK WIDTH
282 fh ADJST
SC FREQUENCY
TP9
TP10
TP11
Y. GAIN
SYNC LEVEL
C. BAL
C. BAL
C. BAL
CHROMA GAIN
BURST START
BURST STOP
SC LOCK
SC PHASE COARSE
SC FINE
H. PHASE

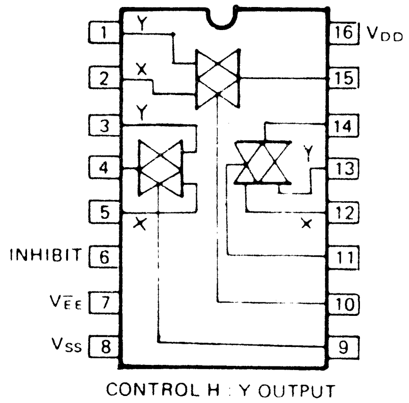
7.19 AUTO SHIFT/AUTO BLACK/AUTO WHITE BLOCK DIAGRAM (AT-1/AT-2 BOARDS)



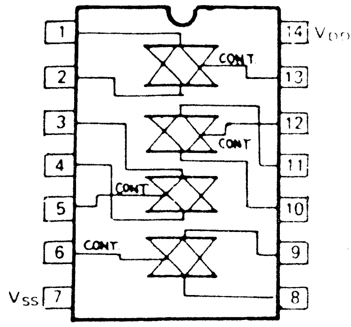
CN4 (TO MT-1)
H PARA IN 20
V PARA IN 5
B IN 14
G IN 29
R IN 13
CP IN 21
AREA GATE 16
+3V IN 22
+5V IN 10
V-SHIFT DET 12
H-SHIFT DET 27
IC 17-1 DIF AMP
IC 17-2 DIF AMP
Q13, Q14 SWITCH
AB/AW/AS Power +9V
AREA GATE
DIF AMP
BUFFER
GATE
CLAMP
BIAS
IC 1
IC 2
IC 3
IC 4-A
IC 4-B
IC 5
IC 6
IC 7
IC 8
IC 9
R1 R-AW
R2 R-AB
R18 B-AW
R14 B-AB
R20 B-V SHIFT
R21 B-H SHIFT
R22 R-V SHIFT
R23 R-H SHIFT
CURRENT
Q15
Q16
Q1
Q3
H-ON
IC 10
IC 11
IC 21
IC 22
WINDOW P.
DOWN
UP
IC 12
IC 13
1/4 SELECT
R/S FF
CAR
REGISTER
DA
D/A
TIMER
60Hz
15Hz
WINDOW PULSE
CLOCK
C24, R220 DIFFERENTIAL
C22, R26 DIFFERENTIAL
IC 15
IC 16
S1
S1 AUTO BLACK
Q2
Q4
D1
D2
D3
D4
D5
D6
D7
D8
D11
L-ON
CN4 (TO MT-1)
26 PILOT P. IN
17 AW CTL
2 AB CTL
3 B AW
1 B AB
18 R AW
19 R AB
6 -5V IN
30 +9V IN
11 BATT IN
28 VD IN
25 AS CTL IN
8 B-V SHIFT
7 R-V SHIFT
24 B-H SHIFT
23 R-H SHIFT
9 AS SUB IN
VD IN 3
B-V SHIFT 8
B-H SHIFT 11
R-V SHIFT 6
ING SIG 7
R-H SHIFT 12
15 +9V
5 AS CTL
14 VDD
2 VREF
1 B-V SHIFT
4 R-V SHIFT
10 B-H SHIFT
9 R-H SHIFT
IC 20-A
IC 20-B
IC 20-C
IC 20-D
IC 24
IC 25
IC 26
IC 27
IC 28
IC 29
IC 30
Q21
Q22
D15
D16
D17
VREF
2SEC TIMER
CLP PULSE
220ms
STOP START
REMOTE LOCAL (VTR)
AT 2 BOARD
IC 18
IC 19
Q17 AMP
Q7 BUFFER
Q18 BUFFER
Q9, Q10 DIF AMP
Q11 CURR REG
Q12 BUFFER
LPF
APARTURE SIGNAL
COMPARATE
V-GATE
H-GATE
V-REF 5V
V-REF 0.1V
V-REF +9V
V-REF 0.06V
X MAX 2Vp-p
X MAX 0.7Vp-p
PIN ⑫⑥ IN
PIN ① OUT
PIN ⑧ OUT
V-GATE GEN.
H-GATE GEN.
AT BOARD


CN4 (TO MT 1)
26 PILOT P. IN
17 AW CTL
2 AB CTL
3 B AW
1 B AB
18 R AW
19 R AB
6 -5V IN
30 +9V IN
11 BATT IN
28 VD IN
25 AS CTL IN
8 B-V SHIFT
7 R-V SHIFT
24 B-H SHIFT
23 R-H SHIFT
9 AS SUB IN
C24, R220 DIFFERENTIAL
C22, R26 DIFFERENTIAL
IC 12
IC 13
IC 15
IC 16
IC 21
IC 22
S1 AUTO BLACK
AB/AW/AS Power +9V
WINDOW PULSE
60Hz
15Hz
CLOCK
IC 24
IC 25
IC 26
IC 27
IC 28
IC 29
IC 30
IC 20-A
IC 20-B
IC 20-C
IC 20-D
2SEC TIMER
CLR PULSE 220ms
VREF
REMOTE LOCAL (VTR)
AT 2 BOARD
AT BOARD
V-REF .5V
V-REF -0.1V
V-REF +9V

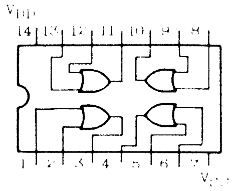
TC4053BF (Multiplexer/Demultiplexer) [TOSHIBA]


VDD
INHIBIT
VEE
VSS
CONTROL H : Y OUTPUT

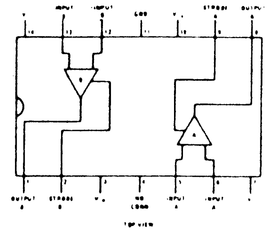
TC4066BF (Qual Bilateral Switch) [TOSHIBA]


VDD
VSS
CONT

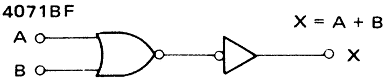
TC4071BF (Quad 2-Input Positine or Gate) [TOSHIBA]



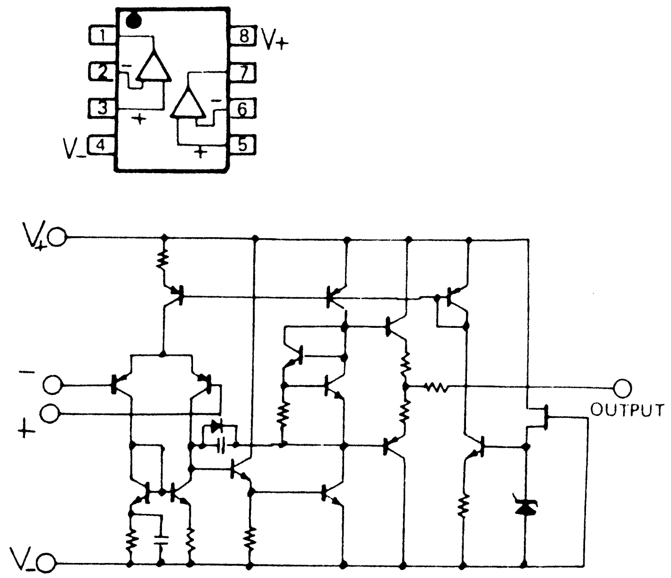
LM1414M (Dual Differential Voltage Comparator) [NATIONAL]



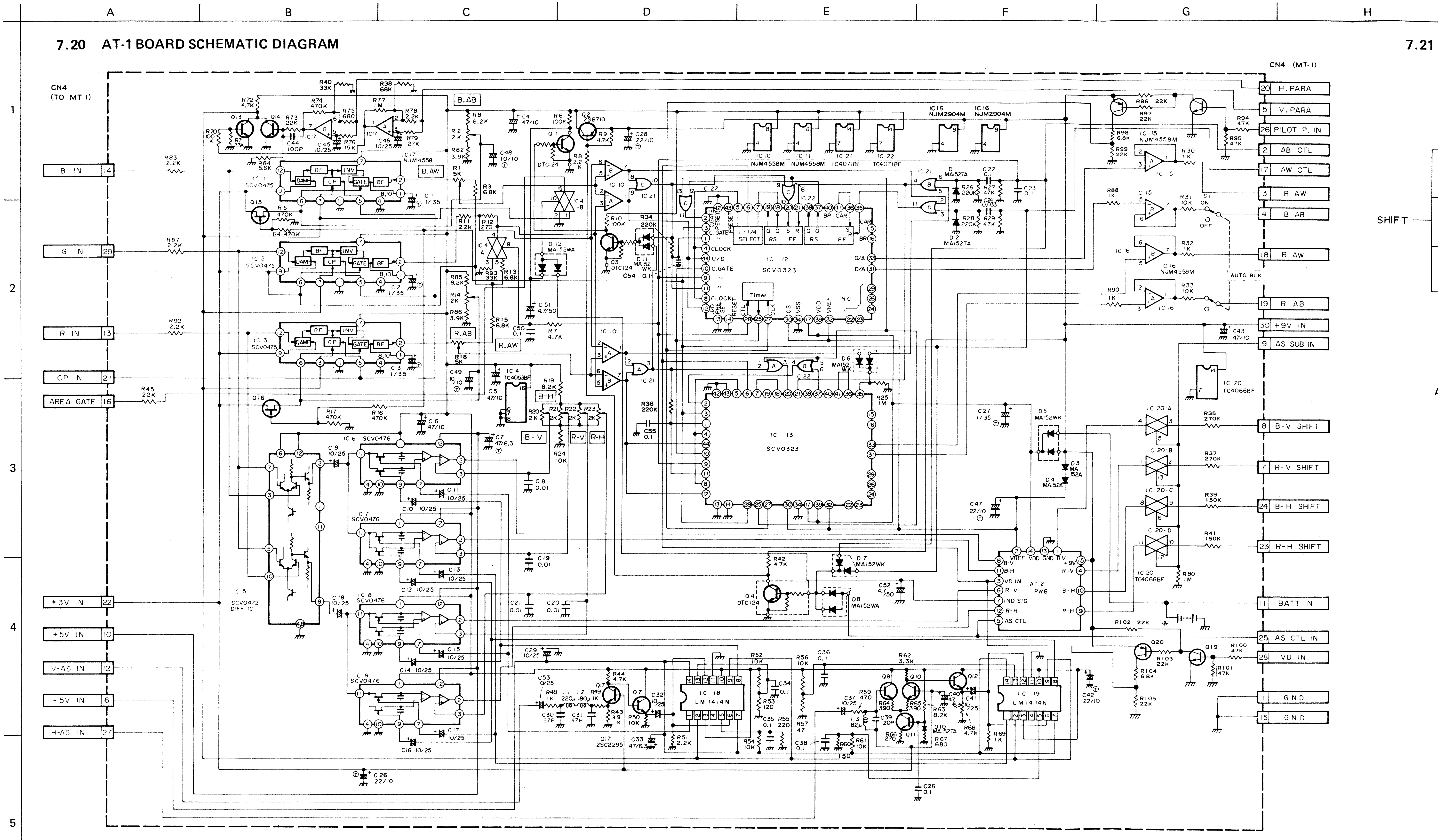
1/4 TC4071BF



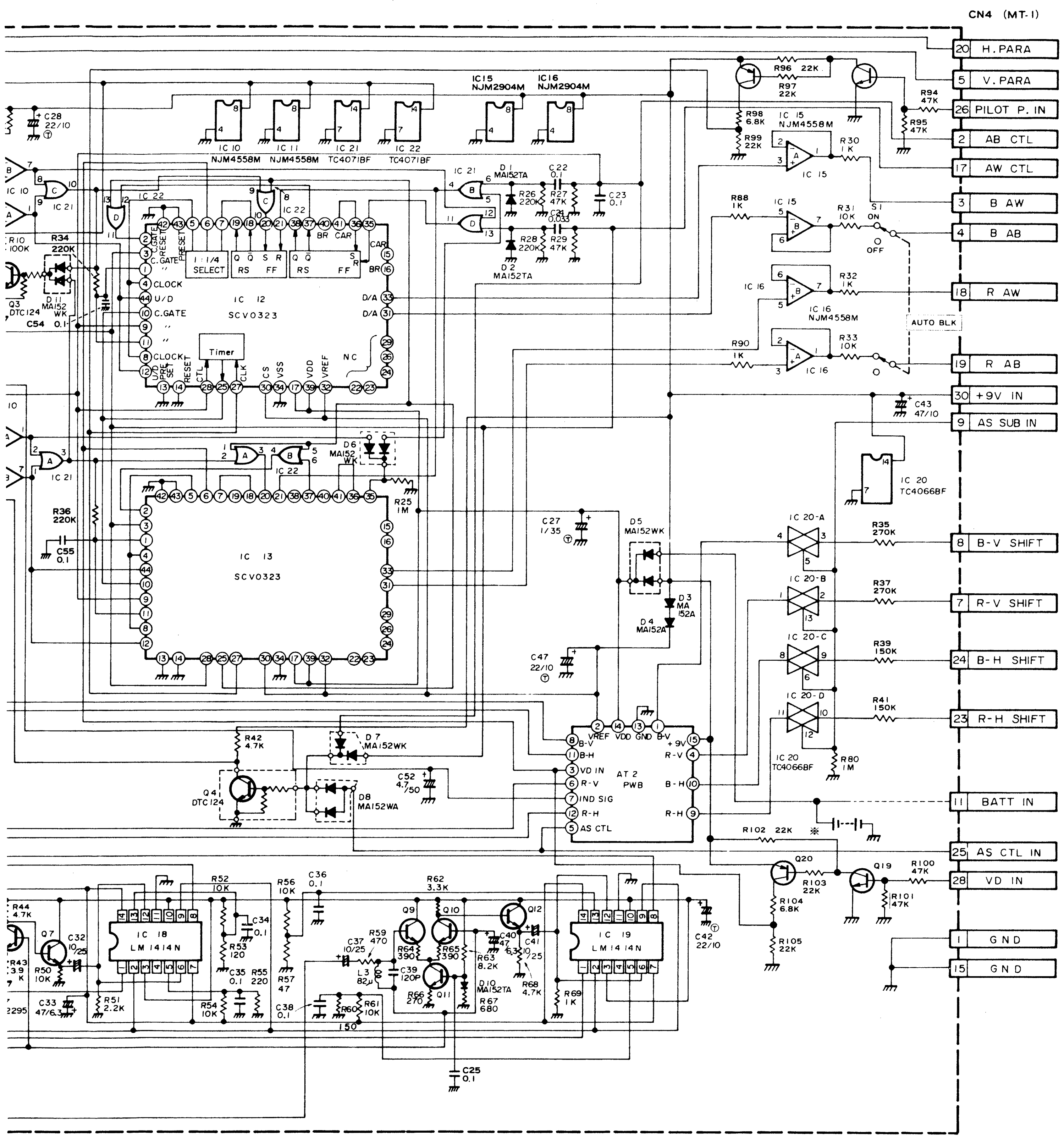
NJM4558M (Dual Op. Amp) [JRC]



7.20 AT-1 BOARD SCHEMATIC DIAGRAM

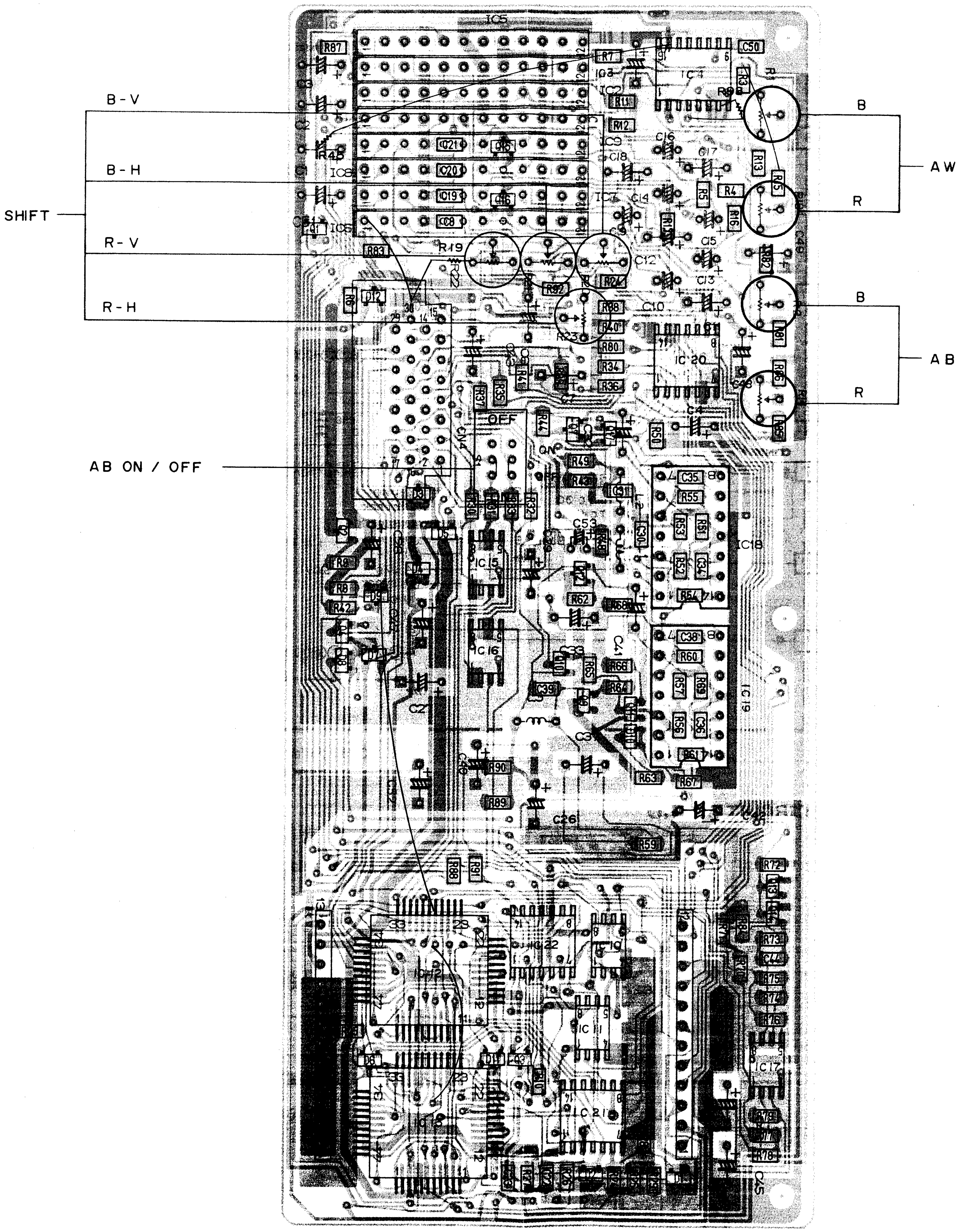

A
B
C
D
E
F
G
H
1
2
3
4
5
CN4
(TO MT-1)
B IN 14
G IN 29
R IN 13
CP IN 21
AREA GATE 16
+3V IN 22
+5V IN 10
V-AS IN 12
-5V IN 6
H-AS IN 27
CN4 (MT-1)
20 H.PARA
5 V.PARA
26 PILOT P. IN
2 AB CTL
17 AW CTL
3 B AW
4 B AB
18 R AW
19 R AB
30 +9V IN
9 AS SUB IN
8 B-V SHIFT
7 R-V SHIFT
24 B-H SHIFT
23 R-H SHIFT
11 BATT IN
25 AS CTL IN
28 VD IN
1 GND
15 GND
SHIFT
IC 1 SCV0475
IC 2 SCV0475
IC 3 SCV0475
IC 5 SCV0472 DIFF IC
IC 6 SCV0476
IC 7 SCV0476
IC 8 SCV0476
IC 9 SCV0476
IC 4 TC4053BF
IC 10 NJM4558M
IC 11 NJM4558M
IC 12 SCV0323
IC 13 SCV0323
IC 15 NJM2904M
IC 16 NJM2904M
IC 15 NJM4558M
IC 16 NJM4558M
IC 17 NJM4558
IC 18 LM1414N
IC 19 LM1414N
IC 20 TC4066BF
IC 21 TC4071BF
IC 22 TC4071BF
AT 2 PWB
Q1 DTC124
Q2 2SB710
Q3 DTC124
Q4 DTC124
Q17 2SC2295
D1 MA152TA
D2 MA152TA
D3 MA152A
D4 MA152A
D5 MA152WK
D6 MA152WK
D7 MA152WK
D8 MA152WA
D10 MA152TA
D11 MA152 WK
D12 MA152WA
B.AB
B.AW
R.AB
R.AW
B-H
B-V
R-V
R-H
S1 ON OFF
AUTO BLK
Timer
BF
INV
DAMP
CP
GATE
CLOCK
U/D
C.GATE
SELECT
RS FF
CAR
BR
D/A
NC
VREF
VDD
VSS
CLK
RESET
R102 22K ※

※ **NOTE:** Memory battery is include in this AT-1 BOARD for Serial Nos. 0395xxxx and after.

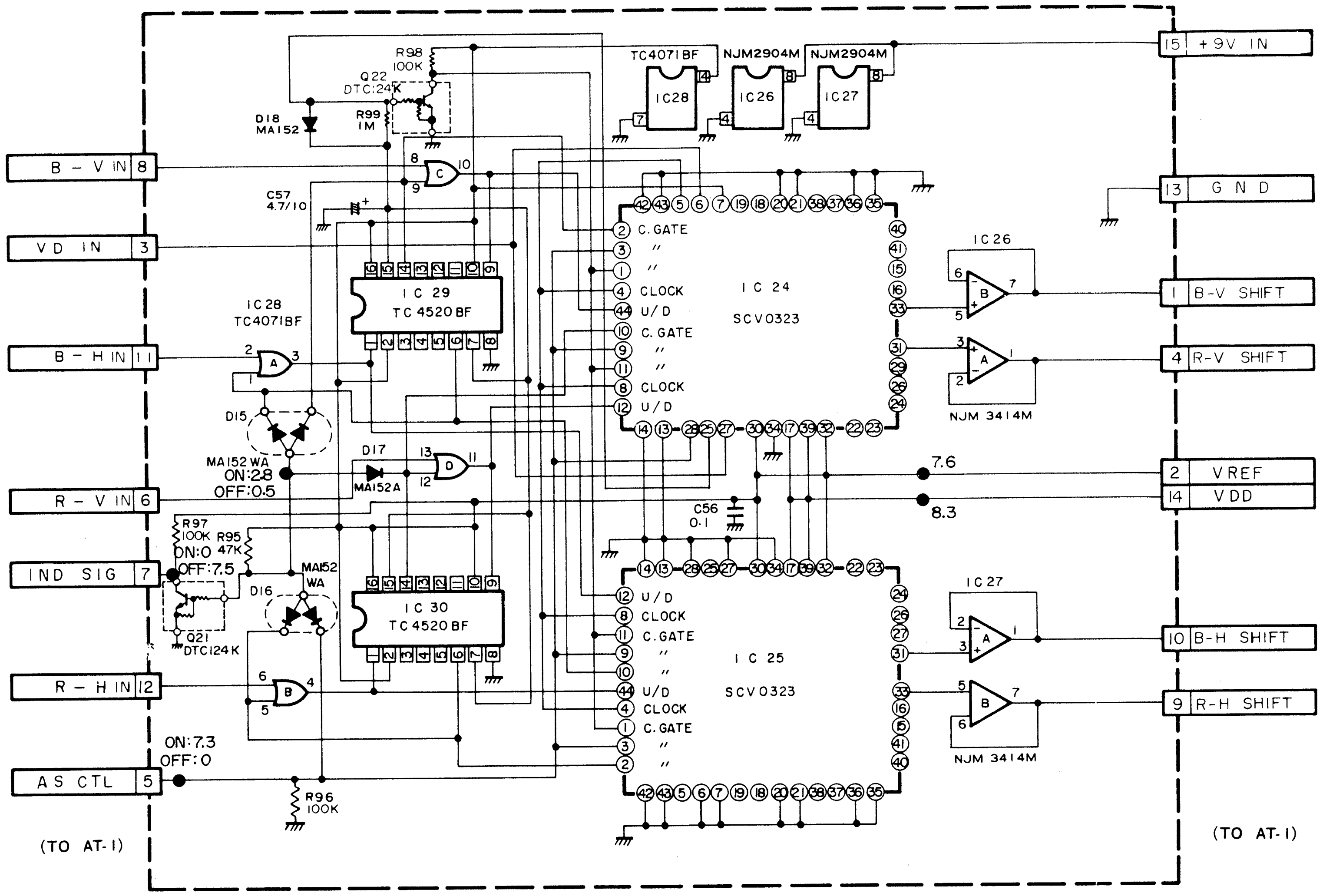

CN4 (MT-1)
20 H.PARA
5 V.PARA
26 PILOT P. IN
2 AB CTL
17 AW CTL
3 B AW
4 B AB
18 R AW
19 R AB
30 +9V IN
9 AS SUB IN
8 B-V SHIFT
7 R-V SHIFT
24 B-H SHIFT
23 R-H SHIFT
11 BATT IN
25 AS CTL IN
28 VD IN
1 GND
15 GND
IC 12 SCV0323
IC 13 SCV0323
IC 15 NJM2904M
IC 16 NJM2904M
IC 10 NJM4558M
IC 11 NJM4558M
IC 21 TC4071BF
IC 22 TC4071BF
IC 15 NJM4558M
IC 16 NJM4558M
IC 20 TC4066BF
AT 2 PWB
IC 18 LM1414N
IC 19 LM1414N
AUTO BLK
Timer
S1 ON OFF

※
NOTE: Memory battery is include in this AT-1 BOARD for Serial Nos. 0395xxxx and after.

7.21 AT-1 CIRCUIT BOARD

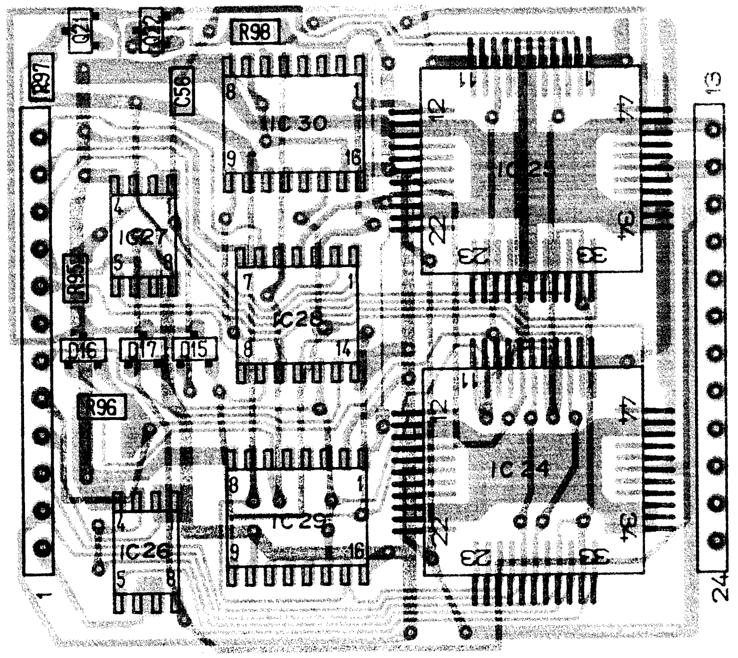

B-V
B-H
SHIFT
R-V
R-H
AB ON / OFF
B
AW
R
B
AB
R
IC5
IC7
IC8
IC15
IC16
IC18
IC19
IC20
IC12
IC11
IC21
IC22
IC17

7.22 AT-2 BOARD SCHEMATIC DIAGRAM

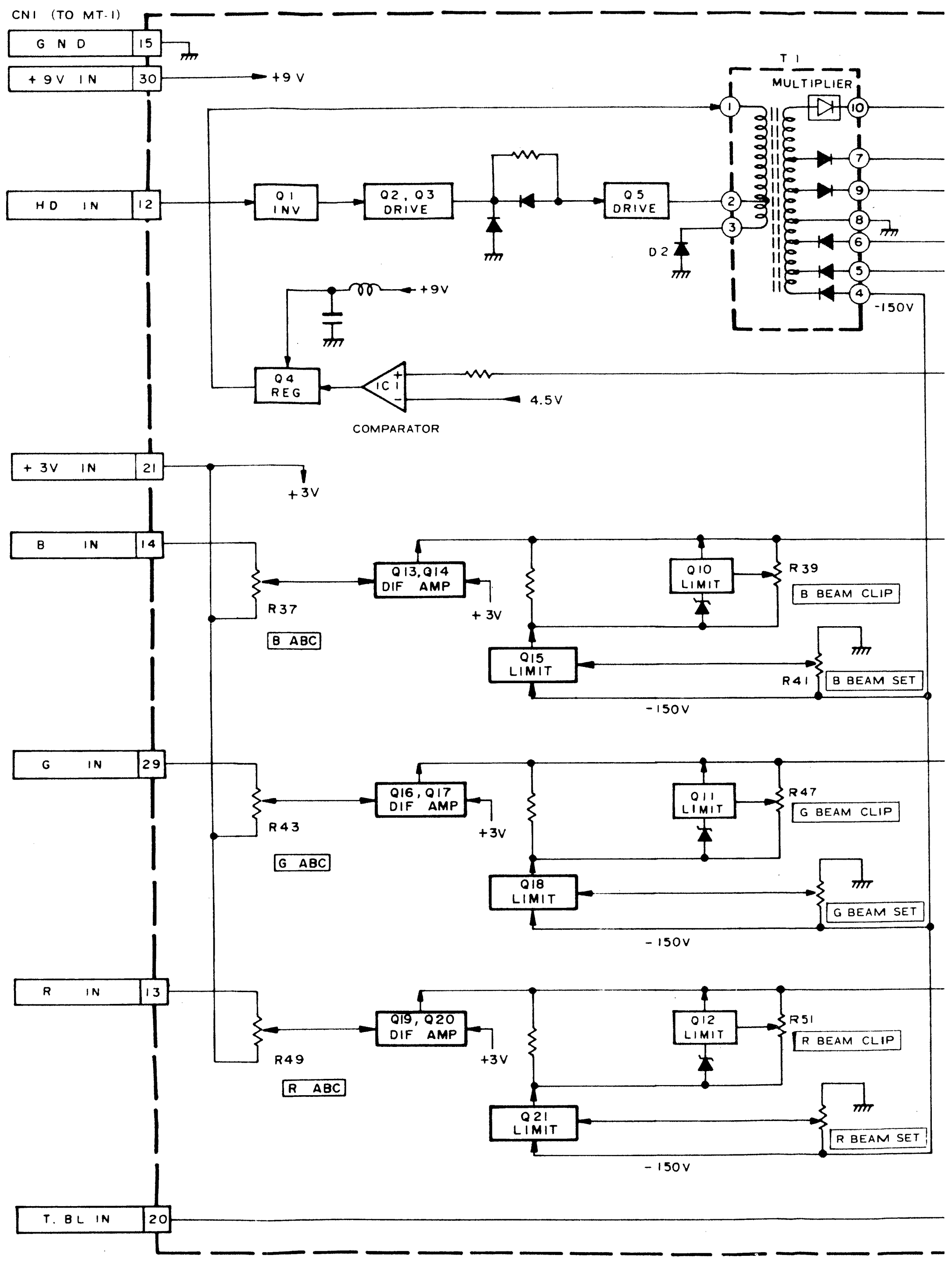

+9V IN
GND
B-V SHIFT
R-V SHIFT
VREF
VDD
B-H SHIFT
R-H SHIFT
B-V IN
VD IN
B-H IN
R-V IN
IND SIG
R-H IN
AS CTL
(TO AT-1)
(TO AT-1)
TC4071BF
NJM2904M
NJM2904M
IC28
IC26
IC27
IC 29
TC 4520 BF
IC 30
TC 4520 BF
IC 24
SCV0323
IC 25
SCV0323
NJM 3414M
NJM 3414M
C. GATE
CLOCK
U/D
R98 100K
Q22 DTC124K
R99 1M
D18 MA152
C57 4.7/10
D15 MA152 WA
D17 MA152A
D16 MA152 WA
R97 100K
R95 47K
Q21 DTC124K
R96 100K
C56 0.1
ON:2.8 OFF:0.5
ON:0 OFF:7.5
ON:7.3 OFF:0
7.6
8.3

NOTE: Refer to "6-19 AUTO SHIFT/BLACK/WHITE BLOCK DIAGRAM" for inside of IC24 and IC25.

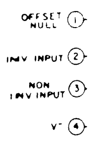
7.23 AT-2 CIRCUIT BOARD

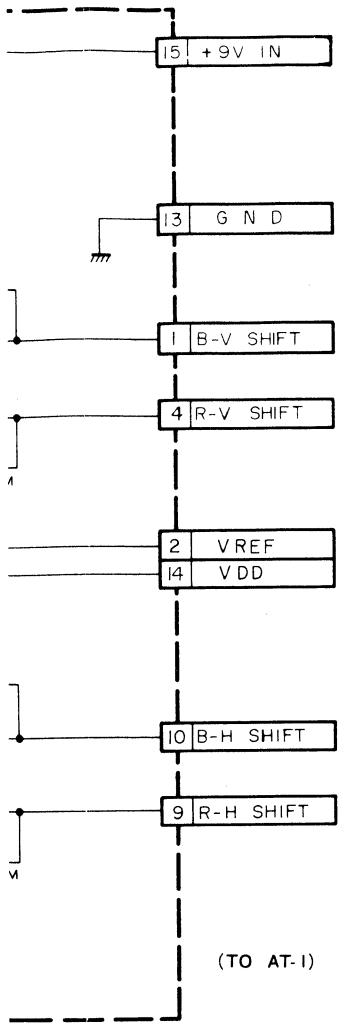

Q21
Q22
R98
R97
C56
IC30
IC25
IC27
IC28
D16
D17
D15
R96
IC24
IC26
IC29
13
24

7.24 POWER SUPPLY BLOCK DIAGRAM (PS BOARD)


CN1 (TO MT-1)
GND
+9V IN
+9V
HD IN
Q1 INV
Q2, Q3 DRIVE
Q5 DRIVE
T1
MULTIPLIER
D2
-150V
+9V
Q4 REG
IC1
COMPARATOR
4.5V
+3V IN
+3V
B IN
Q13, Q14 DIF AMP
Q10 LIMIT
R39
B BEAM CLIP
R37
B ABC
Q15 LIMIT
R41
B BEAM SET
G IN
Q16, Q17 DIF AMP
Q11 LIMIT
R47
G BEAM CLIP
R43
G ABC
Q18 LIMIT
G BEAM SET
R IN
Q19, Q20 DIF AMP
Q12 LIMIT
R51
R BEAM CLIP
R49
R ABC
Q21 LIMIT
R BEAM SET
T. BL IN

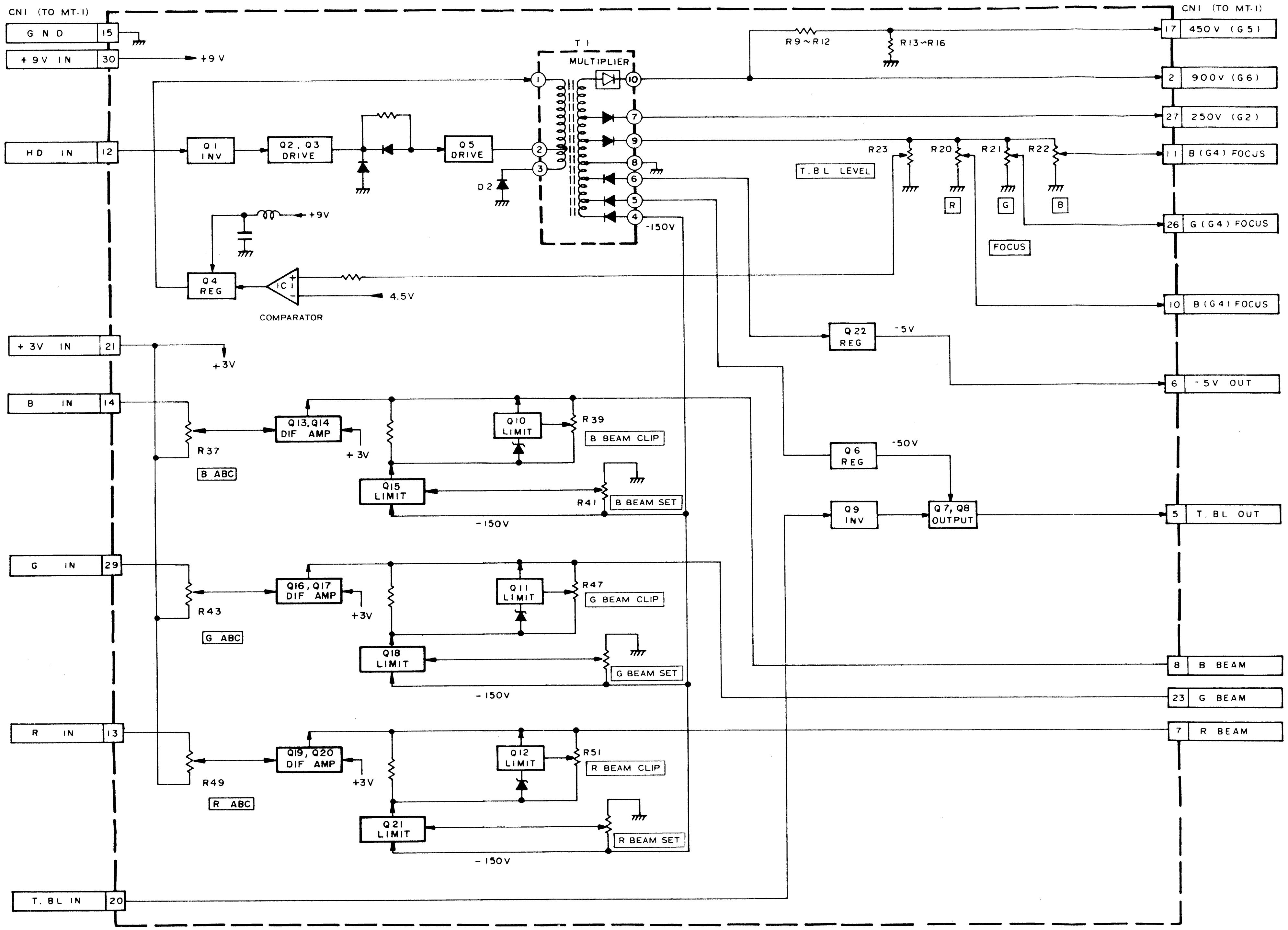
CA3130E


OFFSET NULL
INV INPUT
NON INV INPUT
V-

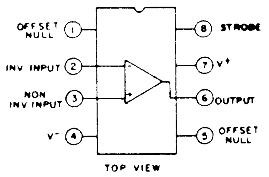

15 +9V IN
13 GND
1 B-V SHIFT
4 R-V SHIFT
2 VREF
14 VDD
10 B-H SHIFT
9 R-H SHIFT
(TO AT-1)

/WHITE BLOCK
25.

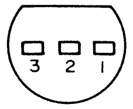
7.24 POWER SUPPLY BLOCK DIAGRAM (PS BOARD)


CN1 (TO MT-1)
GND 15
+9V IN 30
+9V
HD IN 12
Q1 INV
Q2, Q3 DRIVE
Q5 DRIVE
D2
T1
MULTIPLIER
-150V
+9V
Q4 REG
IC1
COMPARATOR
4.5V
+3V IN 21
+3V
B IN 14
R37
B ABC
Q13, Q14 DIF AMP
+3V
Q10 LIMIT
R39
B BEAM CLIP
Q15 LIMIT
R41
B BEAM SET
-150V
G IN 29
R43
G ABC
Q16, Q17 DIF AMP
+3V
Q11 LIMIT
R47
G BEAM CLIP
Q18 LIMIT
G BEAM SET
-150V
R IN 13
R49
R ABC
Q19, Q20 DIF AMP
+3V
Q12 LIMIT
R51
R BEAM CLIP
Q21 LIMIT
R BEAM SET
-150V
T. BL IN 20
R9~R12
R13~R16
R23
T. B L LEVEL
R20
R21
R22
R
G
B
FOCUS
Q22 REG
-5V
Q6 REG
-50V
Q9 INV
Q7, Q8 OUTPUT
CN1 (TO MT-1)
17 450V (G5)
2 900V (G6)
27 250V (G2)
11 B (G4) FOCUS
26 G (G4) FOCUS
10 B (G4) FOCUS
6 -5V OUT
5 T. BL OUT
8 B BEAM
23 G BEAM
7 R BEAM

CA3130E (Op. Amp) [RCA]

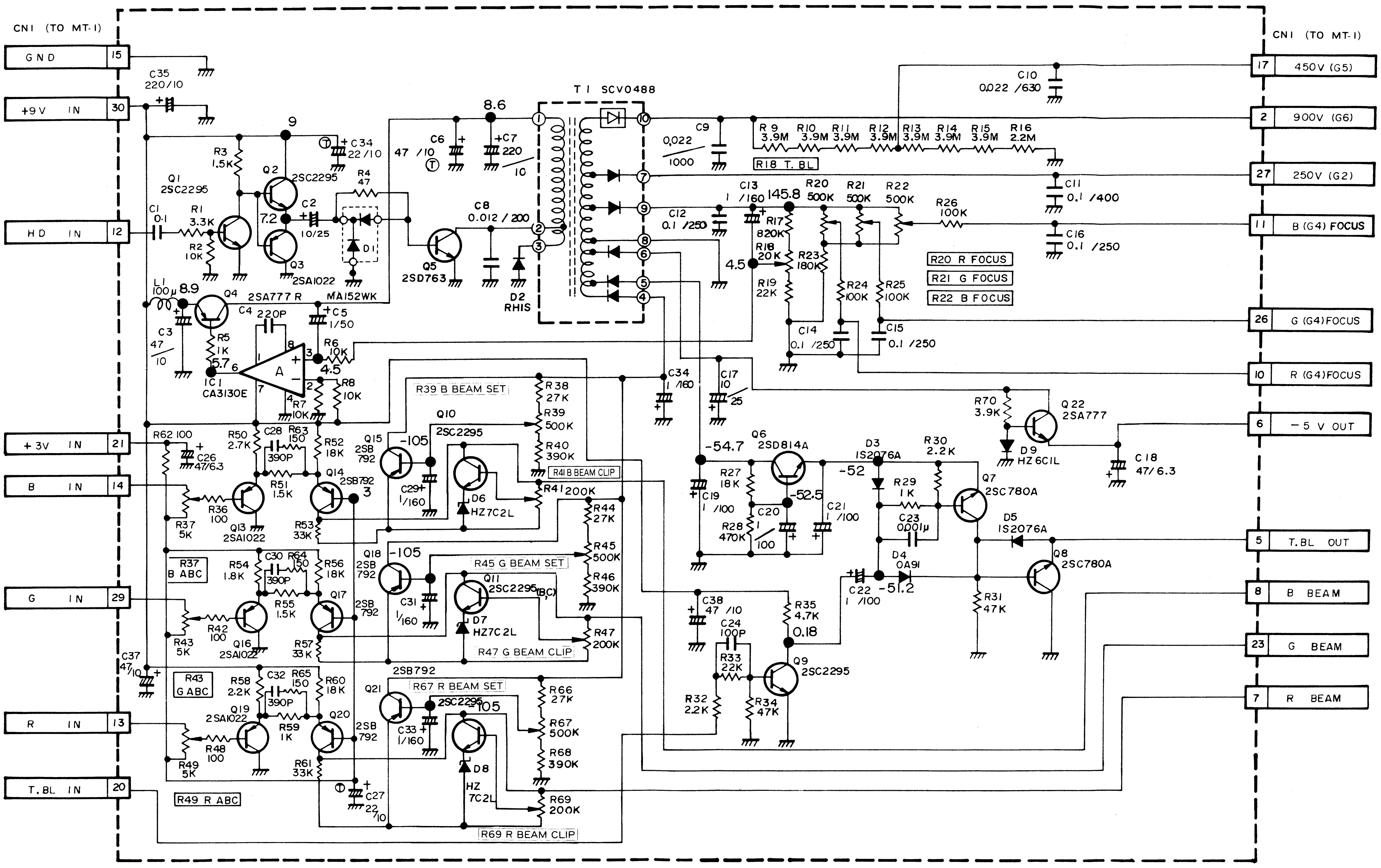

OFFSET NULL 1
INV INPUT 2
NON INV INPUT 3
V⁻ 4
8 STROBE
7 V⁺
6 OUTPUT
5 OFFSET NULL
TOP VIEW

NJM79L05A (Three Terminal Positine Fixed Voltage Regulator) [JRC]

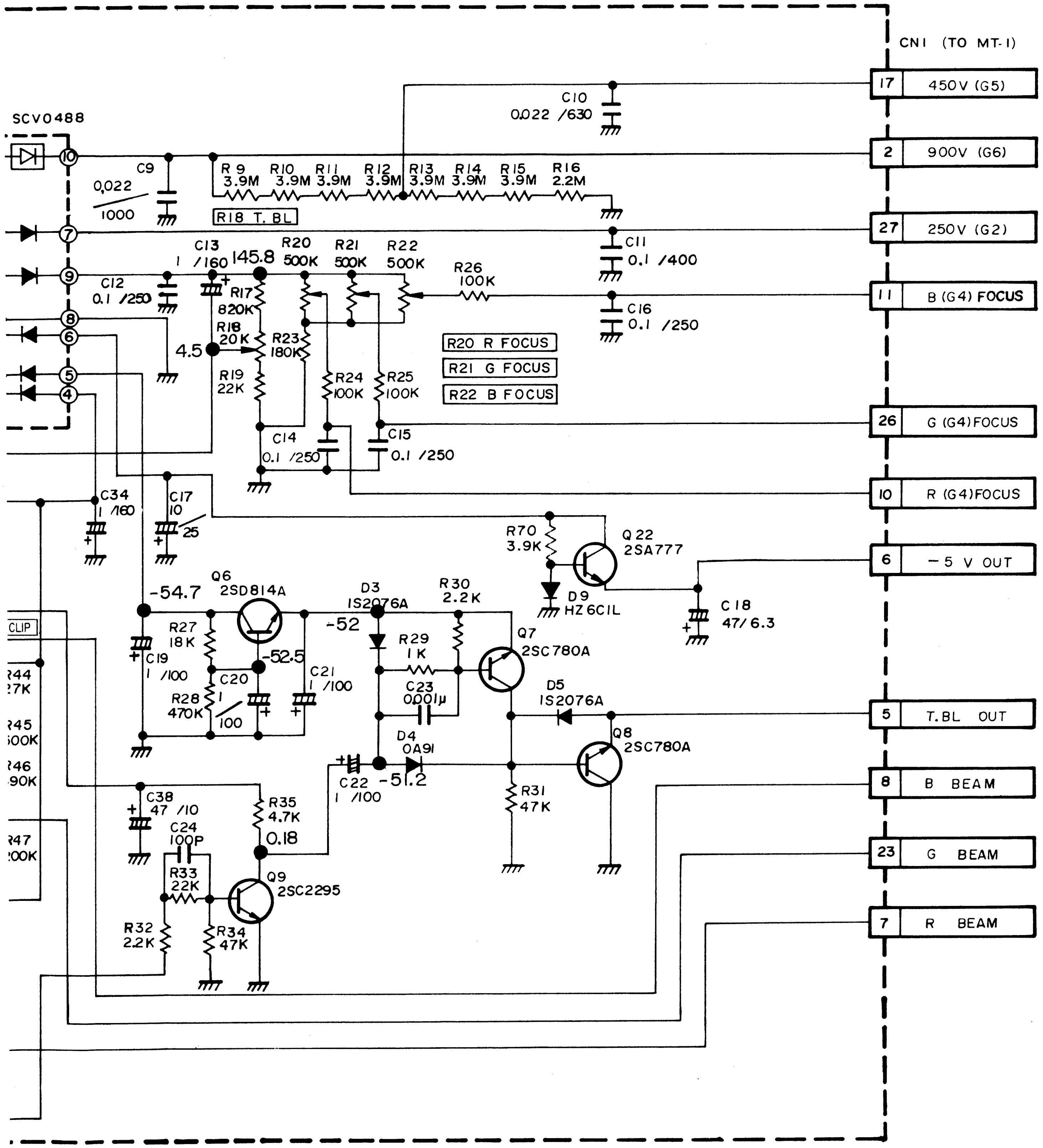


1. INPUT
2. OUTPUT
3. GND

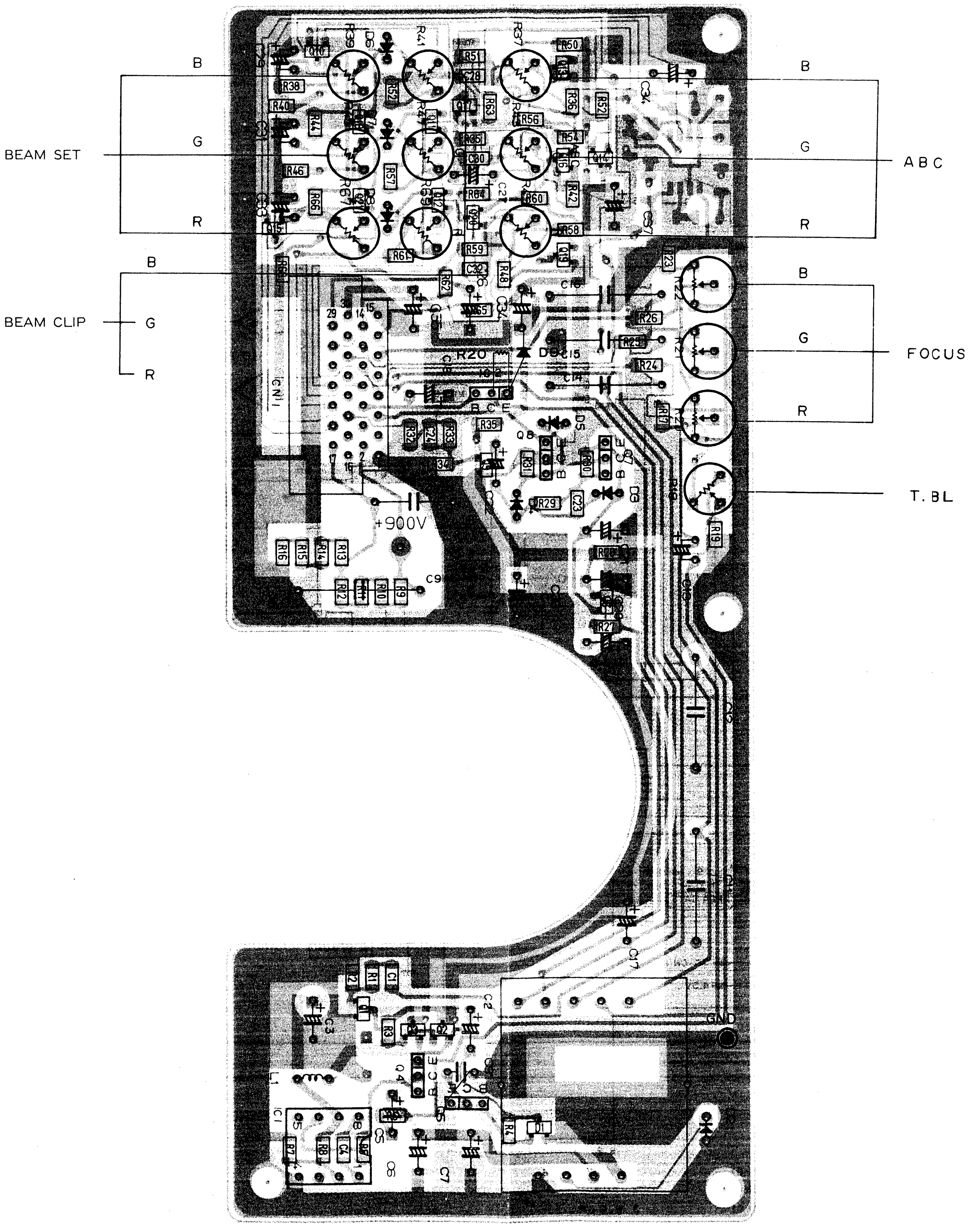
7.25 PS BOARD SCHEMATIC DIAGRAM



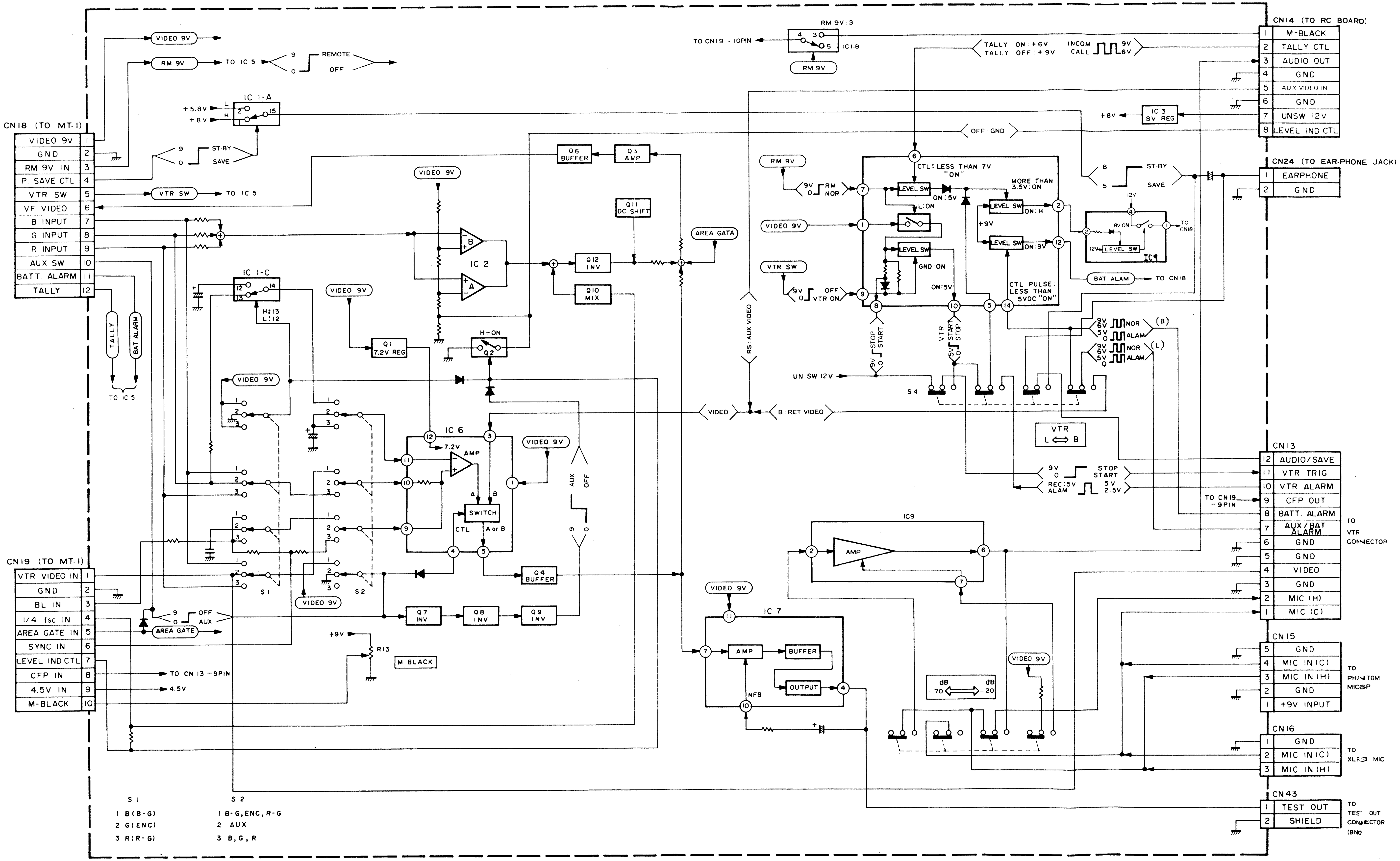
CN1 (TO MT-1)
GND 15
+9V IN 30
HD IN 12
+3V IN 21
B IN 14
G IN 29
R IN 13
T.BL IN 20
C35 220/10
Q1 2SC2295
R3 1.5K
Q2 2SC2295
Q3 2SA1022
C1 0.1
R1 3.3K
R2 10K
C2 10/25
C34 22/10
R4 47
D1 MA152WK
L1 100μ
Q4 2SA777 R
C3 47/10
C4 220P
C5 1/50
R5 1K
R6 10K
IC1 CA3130E
R7 10K
R8 10K
C6 47/10
C7 220/10
C8 0.012/200
Q5 2SD763
D2 RH1S
T1 SCV0488
8.6
9
7.2
8.9
5.7
4.5
C9 0.022/1000
R9 3.9M
R10 3.9M
R11 3.9M
R12 3.9M
R13 3.9M
R14 3.9M
R15 3.9M
R16 2.2M
R18 T.BL
C10 0.022/630
C11 0.1/400
C12 0.1/250
C13 1/160
145.8
R17 820K
R18 20K
R19 22K
R20 500K
R21 500K
R22 500K
R23 180K
R24 100K
R25 100K
R26 100K
C14 0.1/250
C15 0.1/250
C16 0.1/250
R20 R FOCUS
R21 G FOCUS
R22 B FOCUS
C17 10/25
R62 100
C26 47/6.3
R37 5K
R37 B ABC
R36 100
Q13 2SA1022
R50 2.7K
C28 390P
R63 150
R51 1.5K
Q14 2SB792
R52 18K
R53 33K
Q15 2SB792
-105
3
C29 1/160
Q10 2SC2295
D6 HZ7C2L
R39 B BEAM SET
R38 27K
R39 500K
R40 390K
R41 B BEAM CLIP
R41 200K
R54 1.8K
C30 390P
R64 150
R56 18K
R55 1.5K
Q17 2SB792
R42 100
R43 5K
Q16 2SA1022
R57 33K
Q18 2SB792
C31 1/160
Q11 2SC2295 (BC)
D7 HZ7C2L
R45 G BEAM SET
R44 27K
R45 500K
R46 390K
R47 200K
R47 G BEAM CLIP
C37 47/10
R43 G ABC
R58 2.2K
C32 390P
R65 150
R60 18K
Q19 2SA1022
R59 1K
Q20 2SB792
R48 100
R49 5K
R61 33K
Q21 2SB792
C33 1/160
2SC2295
D8 HZ7C2L
R67 R BEAM SET
R66 27K
R67 500K
R68 390K
R69 200K
R69 R BEAM CLIP
C27 22/10
R49 R ABC
C34 1/160
-54.7
Q6 2SD814A
R27 18K
C19 1/100
C20 1/100
R28 470K
-52.5
C21 1/100
C38 47/10
C24 100P
R33 22K
R32 2.2K
R34 47K
R35 4.7K
0.18
Q9 2SC2295
D3 1S2076A
-52
R29 1K
C23 0.001μ
R30 2.2K
Q7 2SC780A
D5 1S2076A
D4 OA91
C22 1/100
-51.2
R31 47K
Q8 2SC780A
R70 3.9K
D9 HZ6C1L
Q22 2SA777
C18 47/6.3
CN1 (TO MT-1)
17 450V (G5)
2 900V (G6)
27 250V (G2)
11 B (G4) FOCUS
26 G (G4) FOCUS
10 R (G4) FOCUS
6 -5 V OUT
5 T.BL OUT
8 B BEAM
23 G BEAM
7 R BEAM


CN1 (TO MT-1)
17 450V (G5)
2 900V (G6)
27 250V (G2)
11 B (G4) FOCUS
26 G (G4) FOCUS
10 R (G4) FOCUS
6 −5 V OUT
5 T.BL OUT
8 B BEAM
23 G BEAM
7 R BEAM
SCV0488
C10 0.022 /630
C9 0.022 /1000
R9 3.9M
R10 3.9M
R11 3.9M
R12 3.9M
R13 3.9M
R14 3.9M
R15 3.9M
R16 2.2M
R18 T.BL
C11 0.1 /400
C12 0.1 /250
C13 1 /160
145.8
R20 500K
R21 500K
R22 500K
R26 100K
C16 0.1 /250
R17 820K
R18 20K
4.5
R23 180K
R19 22K
R24 100K
R25 100K
R20 R FOCUS
R21 G FOCUS
R22 B FOCUS
C14 0.1 /250
C15 0.1 /250
C34 1 /160
C17 10 /25
R70 3.9K
Q22 2SA777
D9 HZ6C1L
C18 47/6.3
Q6 2SD814A
−54.7
D3 1S2076A
R30 2.2K
−52
R27 18K
−52.5
R29 1K
Q7 2SC780A
C19 1 /100
C20 1 /100
C21 1 /100
C23 0.001μ
R28 470K
D5 1S2076A
D4 0A91
Q8 2SC780A
C22 1 /100
−51.2
C38 47 /10
R35 4.7K
0.18
R31 47K
C24 100P
R33 22K
Q9 2SC2295
R32 2.2K
R34 47K
CLIP
R44 27K
R45 500K
R46 390K
R47 200K

7.26 PS CIRCUIT BOARD


BEAM SET
B
G
R
ABC
BEAM CLIP
B
G
R
FOCUS
B
G
R
T.BL
+900V
CN1
GND

7.27 CONTROLS AND MIC AMP BLOCK DIAGRAM (CT BOARD)

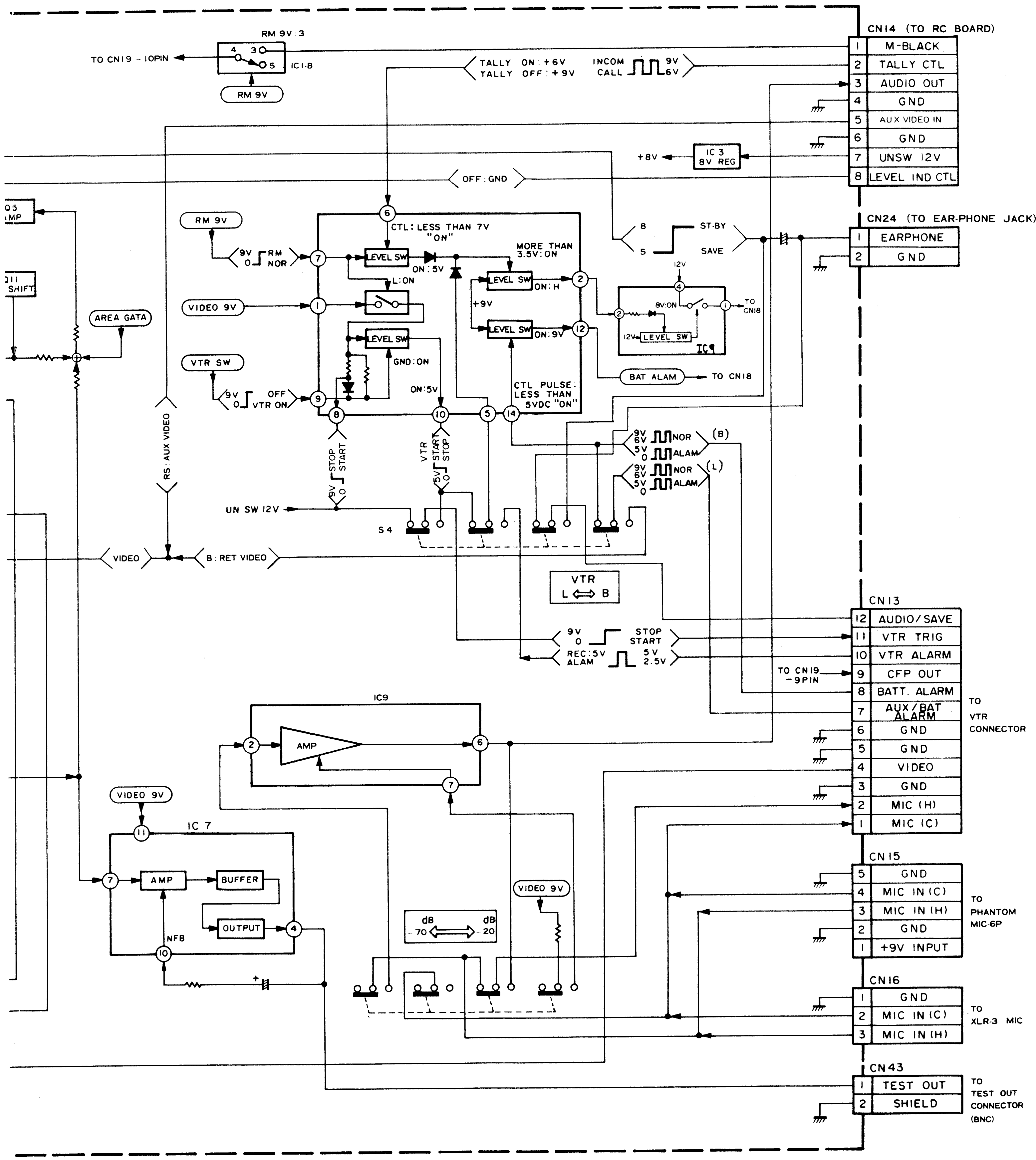


CN18 (TO MT-1)
1 VIDEO 9V
2 GND
3 RM 9V IN
4 P. SAVE CTL
5 VTR SW
6 VF VIDEO
7 B INPUT
8 G INPUT
9 R INPUT
10 AUX SW
11 BATT. ALARM
12 TALLY
VIDEO 9V
RM 9V
TO IC 5
REMOTE
OFF
IC 1-A
+5.8V
+8V
ST-BY
SAVE
VTR SW
TO IC 5
TALLY
BAT ALARM
TO IC 5
IC 1-C
H:13
L:12
IC 2
VIDEO 9V
Q1 7.2V REG
Q2
H=ON
Q6 BUFFER
Q5 AMP
Q11 DC SHIFT
Q12 INV
Q10 MIX
AREA GATA
IC 6
7.2V
AMP
SWITCH
CTL
A or B
Q4 BUFFER
Q7 INV
Q8 INV
Q9 INV
AUX
OFF
S1
S2
CN19 (TO MT-1)
1 VTR VIDEO IN
2 GND
3 BL IN
4 1/4 fsc IN
5 AREA GATE IN
6 SYNC IN
7 LEVEL IND CTL
8 CFP IN
9 4.5V IN
10 M-BLACK
AREA GATE
TO CN 13 -9PIN
4.5V
+9V
R13
M BLACK
S1
1 B(B-G)
2 G(ENC)
3 R(R-G)
S2
1 B-G, ENC, R-G
2 AUX
3 B, G, R
RM 9V: 3
TO CN19 · 10PIN
IC1-B
RM 9V
TALLY ON: +6V
TALLY OFF: +9V
INCOM CALL 9V 6V
OFF GND
+8V
IC 3 8V REG
CN14 (TO RC BOARD)
1 M-BLACK
2 TALLY CTL
3 AUDIO OUT
4 GND
5 AUX VIDEO IN
6 GND
7 UNSW 12V
8 LEVEL IND CTL
CN24 (TO EAR-PHONE JACK)
1 EARPHONE
2 GND
ST-BY
SAVE
CTL: LESS THAN 7V "ON"
LEVEL SW
ON: 5V
L: ON
MORE THAN 3.5V: ON
ON: H
+9V
ON: 9V
GND: ON
ON: 5V
CTL PULSE: LESS THAN 5VDC "ON"
RM 9V
9V RM
0 NOR
VIDEO 9V
VTR SW
9V OFF
0 VTR ON
12V
8V ON
LEVEL SW
IC9
TO CN18
BAT ALAM
TO CN18
RS: AUX VIDEO
9V STOP
0 START
VTR
5V START
0 STOP
UN SW 12V
S4
9V NOR
6V
5V ALAM
0
(B)
(L)
VIDEO
B: RET VIDEO
VTR L ⟺ B
9V STOP
0 START
REC: 5V 5V
ALAM 2.5V
CN13
12 AUDIO/SAVE
11 VTR TRIG
10 VTR ALARM
9 CFP OUT
8 BATT. ALARM
7 AUX/BAT ALARM
6 GND
5 GND
4 VIDEO
3 GND
2 MIC (H)
1 MIC (C)
TO CN19 -9PIN
TO VTR CONNECTOR
IC9
AMP
VIDEO 9V
IC 7
AMP
BUFFER
OUTPUT
NFB
dB -70 ⟺ dB -20
VIDEO 9V
CN15
5 GND
4 MIC IN (C)
3 MIC IN (H)
2 GND
1 +9V INPUT
TO PHANTOM MIC6P
CN16
1 GND
2 MIC IN (C)
3 MIC IN (H)
TO XLR3 MIC
CN43
1 TEST OUT
2 SHIELD
TO TEST OUT CONNECTOR (BNC)

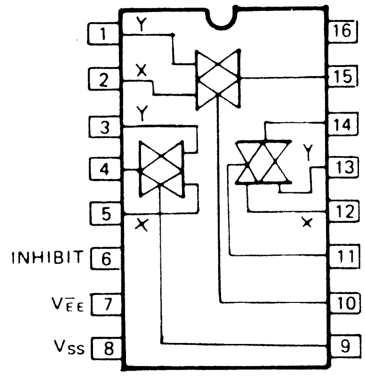
TC405

TA78

μPC59

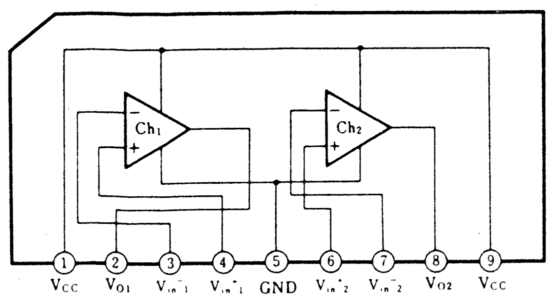

CN14 (TO RC BOARD)
1 M-BLACK
2 TALLY CTL
3 AUDIO OUT
4 GND
5 AUX VIDEO IN
6 GND
7 UNSW 12V
8 LEVEL IND CTL
CN24 (TO EAR-PHONE JACK)
1 EARPHONE
2 GND
CN13
12 AUDIO/SAVE
11 VTR TRIG
10 VTR ALARM
9 CFP OUT
8 BATT. ALARM
7 AUX/BAT ALARM
6 GND
5 GND
4 VIDEO
3 GND
2 MIC (H)
1 MIC (C)
TO VTR CONNECTOR
CN15
5 GND
4 MIC IN (C)
3 MIC IN (H)
2 GND
1 +9V INPUT
TO PHANTOM MIC-6P
CN16
1 GND
2 MIC IN (C)
3 MIC IN (H)
TO XLR-3 MIC
CN43
1 TEST OUT
2 SHIELD
TO TEST OUT CONNECTOR (BNC)
RM 9V:3
TO CN19 - 10PIN
IC1-B
RM 9V
TALLY ON: +6V
TALLY OFF: +9V
INCOM CALL 9V 6V
IC3 8V REG
+8V
OFF: GND
ST-BY
SAVE
CTL: LESS THAN 7V "ON"
LEVEL SW
ON: 5V
MORE THAN 3.5V: ON
L: ON
ON: H
+9V
ON: 9V
GND: ON
ON: 5V
CTL PULSE: LESS THAN 5VDC "ON"
VIDEO 9V
VTR SW
9V OFF 0 VTR ON
9V RM 0 NOR
AREA GATA
Q5 AMP
Q11 SHIFT
12V
8V: ON
TO CN18
LEVEL SW
IC9
BAT ALAM
RS: AUX VIDEO
STOP START
VTR START STOP
UN SW 12V
S4
9V 6V 5V 0 NOR ALARM (B)
9V 6V 5V 0 NOR ALARM (L)
VIDEO
B: RET VIDEO
VTR L ⟺ B
9V 0 STOP START
REC: 5V ALARM 5V 2.5V
TO CN19 -9PIN
IC9
AMP
VIDEO 9V
IC 7
AMP
BUFFER
OUTPUT
NFB
dB -70 ⟺ dB -20

TC4053BF (Multiplexer/Demultiplexer) [TOSHIBA]


VDD
INHIBIT
VEE
VSS
X
Y
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

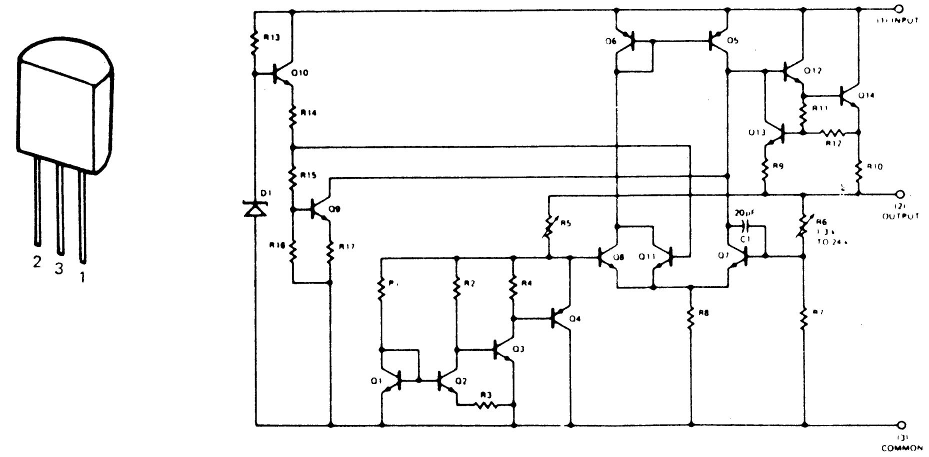
CONTROL H : Y OUTPUT

AM6913 (Dual Comparator) [MATSUSHITA]

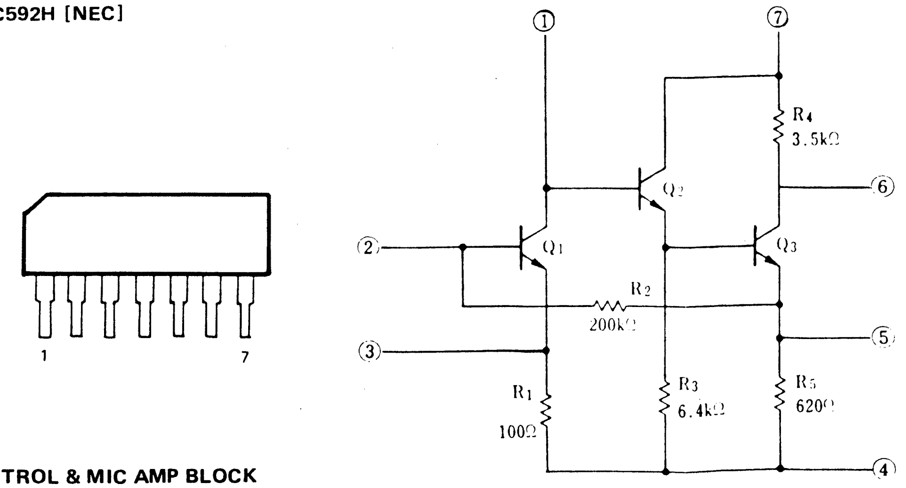

Ch1
Ch2
VCC
VO1
Vin-1
Vin+1
GND
Vin+2
Vin-2
VO2
VCC

Pin No.	
1	Vcc
2	CH. 1 output
3	CH.1 INV. input
4	CH. 1 Non INV. input
5	Ground
6	CH. 2 Non INV. input
7	CH. 2 INV. input
8	CH. 2 output
9	Vcc

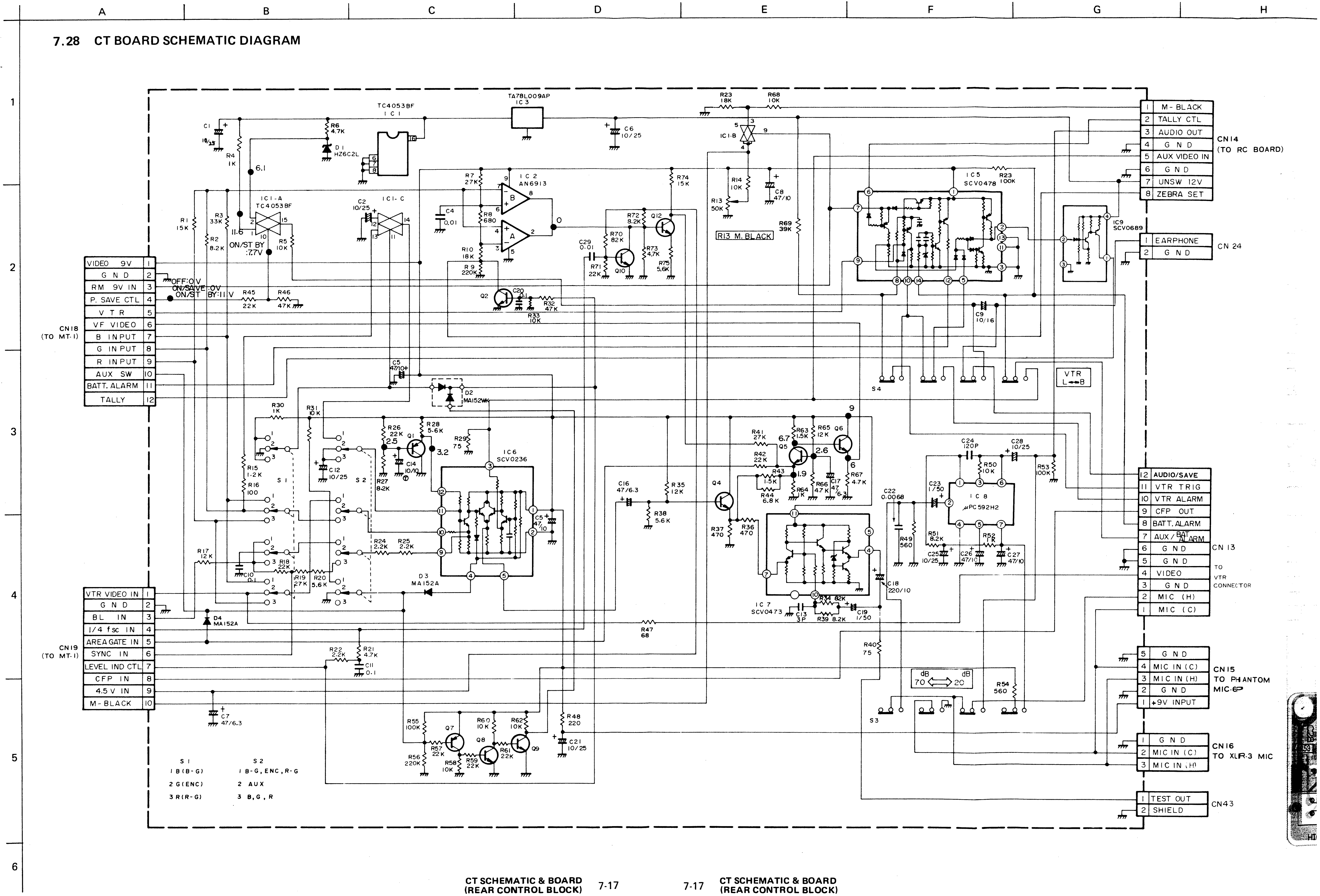
TA78L009AP (Voltage Regulator 9 V) [TOSHIBA]

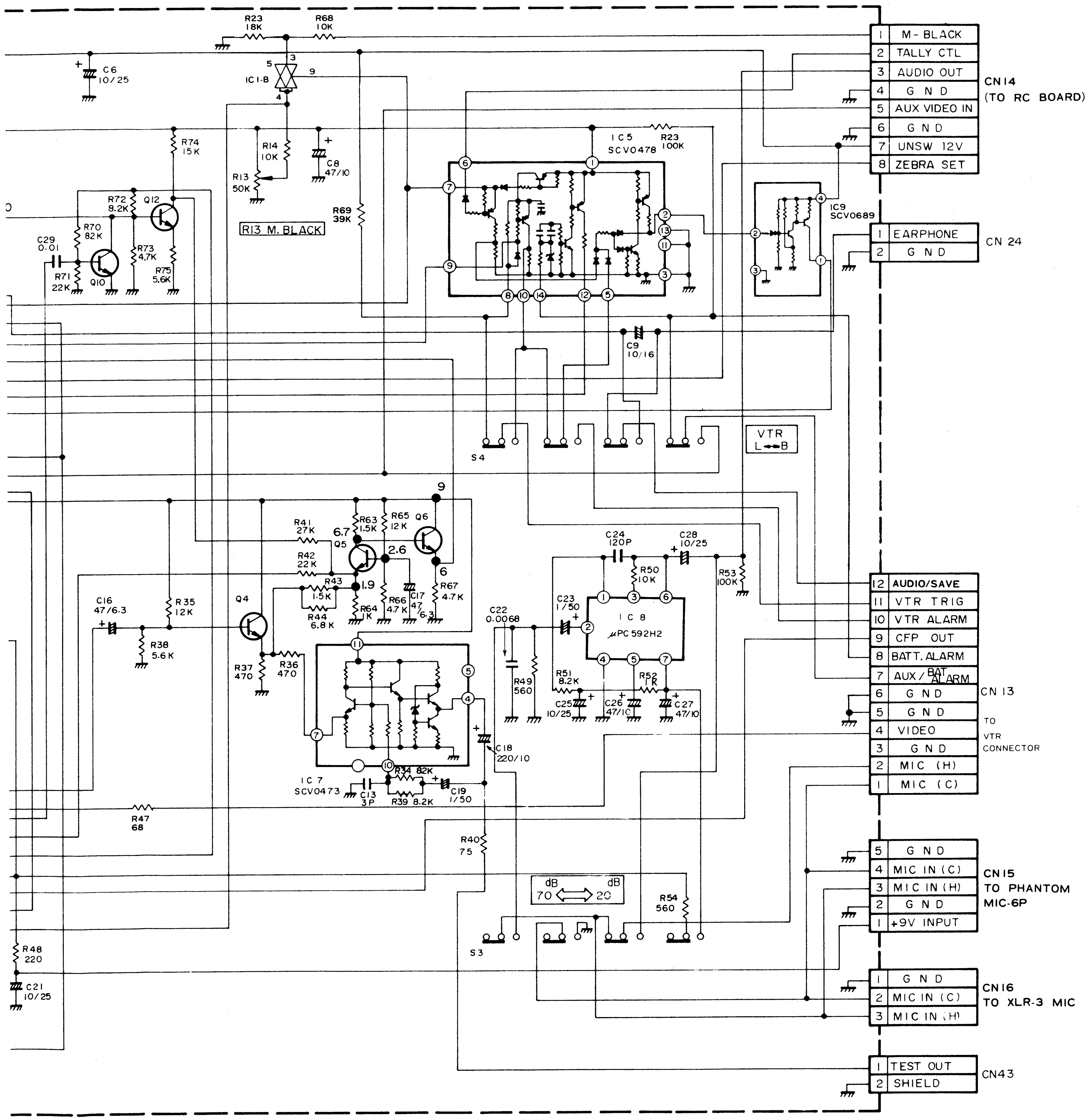

2 3 1
(1) INPUT
(2) OUTPUT
(3) COMMON
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
Q14
D1
R3
R5
R6
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
C1

µPC592H [NEC]

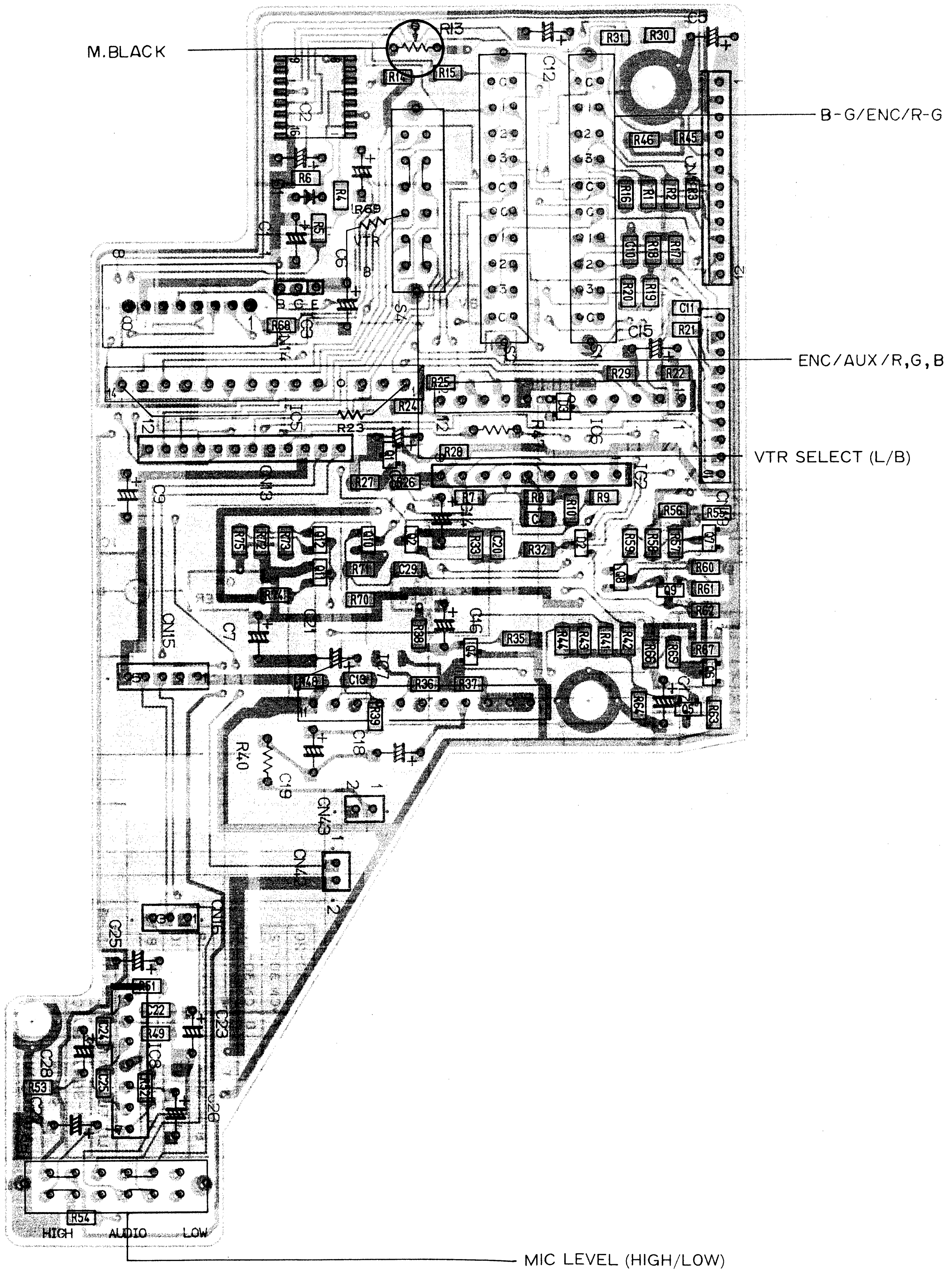

1
7
①
②
③
④
⑤
⑥
⑦
Q1
Q2
Q3
R1 100Ω
R2 200kΩ
R3 6.4kΩ
R4 3.5kΩ
R5 620Ω

7.28 CT BOARD SCHEMATIC DIAGRAM

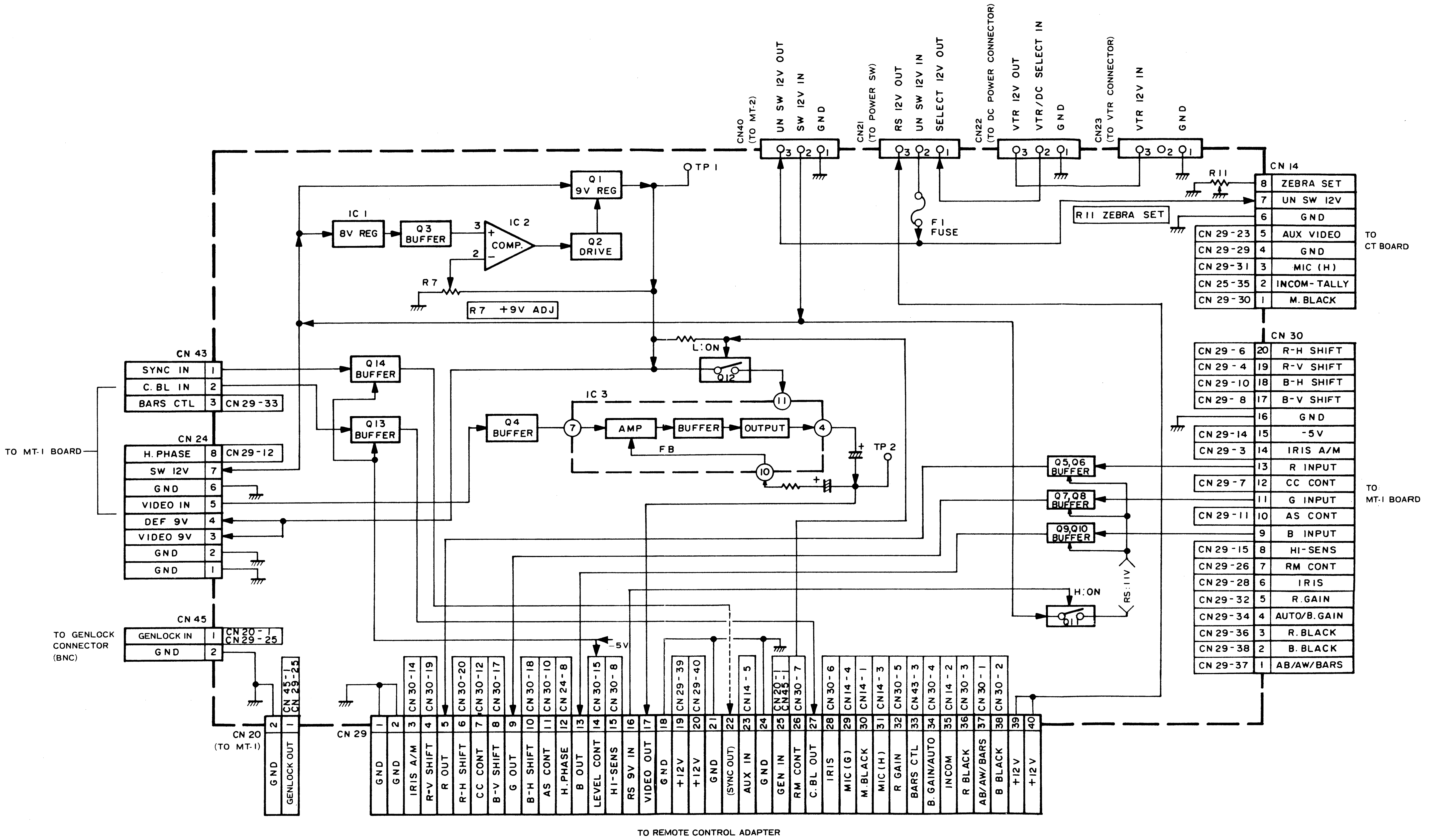

A
B
C
D
E
F
G
H
1
2
3
4
5
6
TA78L009AP
IC3
TC4053BF
IC1
C1 10/25
R4 1K
R6 4.7K
D1 HZ6C2L
6.1
R3 33K
R1 15K
R2 8.2K
IC1-A TC4053BF
11.6
ON/ST BY :7.7V
R5 10K
C2 10/25
IC1-C
C6 10/25
R7 27K
IC2 AN6913
C4 0.01
R8 680
R10 18K
R9 220K
0
R74 15K
R72 8.2K
Q12
R70 82K
C29 0.01
R71 22K
Q10
R73 4.7K
R75 5.6K
Q2
C20
R32 47K
R33 10K
R23 18K
R68 10K
IC1-B
R14 10K
R13 50K
C8 47/10
R13 M.BLACK
R69 39K
IC5 SCV0478
R23 100K
C9 10/16
IC9 SCV0689
S4
VTR L⟷B
CN18 (TO MT-1)
VIDEO 9V 1
GND 2
RM 9V IN 3
P.SAVE CTL 4
VTR 5
VF VIDEO 6
B INPUT 7
G INPUT 8
R INPUT 9
AUX SW 10
BATT. ALARM 11
TALLY 12
OFF:0V
ON/SAVE:0V
ON/ST BY:11V
R45 22K
R46 47K
CN14 (TO RC BOARD)
1 M-BLACK
2 TALLY CTL
3 AUDIO OUT
4 GND
5 AUX VIDEO IN
6 GND
7 UNSW 12V
8 ZEBRA SET
CN24
1 EARPHONE
2 GND
C5 47/10
D2 MA152WK
R30 1K
R31 10K
R26 22K
2.5
Q1
R28 5.6K
3.2
R29 75
C12 10/25
C14 10/10
R27 8.2K
IC6 SCV0236
R15 1.2K
R16 100
S1
S2
C5 47/10
R17 12K
C10 0.1
R18 22K
R19 27K
R20 5.6K
R24 2.2K
R25 2.2K
D3 MA152A
C16 47/6.3
R35 12K
R38 5.6K
Q4
R37 470
R36 470
R41 27K
R42 22K
R43 1.5K
R44 6.8K
R63 1.5K
6.7
Q5
R65 12K
Q6
9
2.6
1.9
R64 1K
R66 4.7K
C17 47/6.3
6
R67 4.7K
IC7 SCV0473
C13 3P
R34 82K
R39 8.2K
C19 1/50
C18 220/10
R47 68
R40 75
C24 120P
C28 10/25
R50 10K
R53 100K
C22 0.0068
C23 1/50
IC8 µPC592H2
R49 560
R51 8.2K
R52 1K
C25 10/25
C26 47/10
C27 47/10
CN13 TO VTR CONNECTOR
12 AUDIO/SAVE
11 VTR TRIG
10 VTR ALARM
9 CFP OUT
8 BATT. ALARM
7 AUX/BAT ALARM
6 GND
5 GND
4 VIDEO
3 GND
2 MIC (H)
1 MIC (C)
CN19 (TO MT-1)
VTR VIDEO IN 1
GND 2
BL IN 3
1/4 fsc IN 4
AREA GATE IN 5
SYNC IN 6
LEVEL IND CTL 7
CFP IN 8
4.5V IN 9
M-BLACK 10
D4 MA152A
R22 2.2K
R21 4.7K
C11 0.1
C7 47/6.3
R55 100K
Q7
R57 22K
R56 220K
R58 10K
Q8
R59 22K
R60 10K
R62 10K
R61 22K
Q9
R48 220
C21 10/25
dB 70 ⟺ dB 20
R54 560
S3
CN15 TO PHANTOM MIC-6P
5 GND
4 MIC IN (C)
3 MIC IN (H)
2 GND
1 +9V INPUT
CN16 TO XLR-3 MIC
1 GND
2 MIC IN (C)
3 MIC IN (H)
CN43
1 TEST OUT
2 SHIELD
S1
1 B(B-G)
2 G(ENC)
3 R(R-G)
S2
1 B-G, ENC, R-G
2 AUX
3 B, G, R

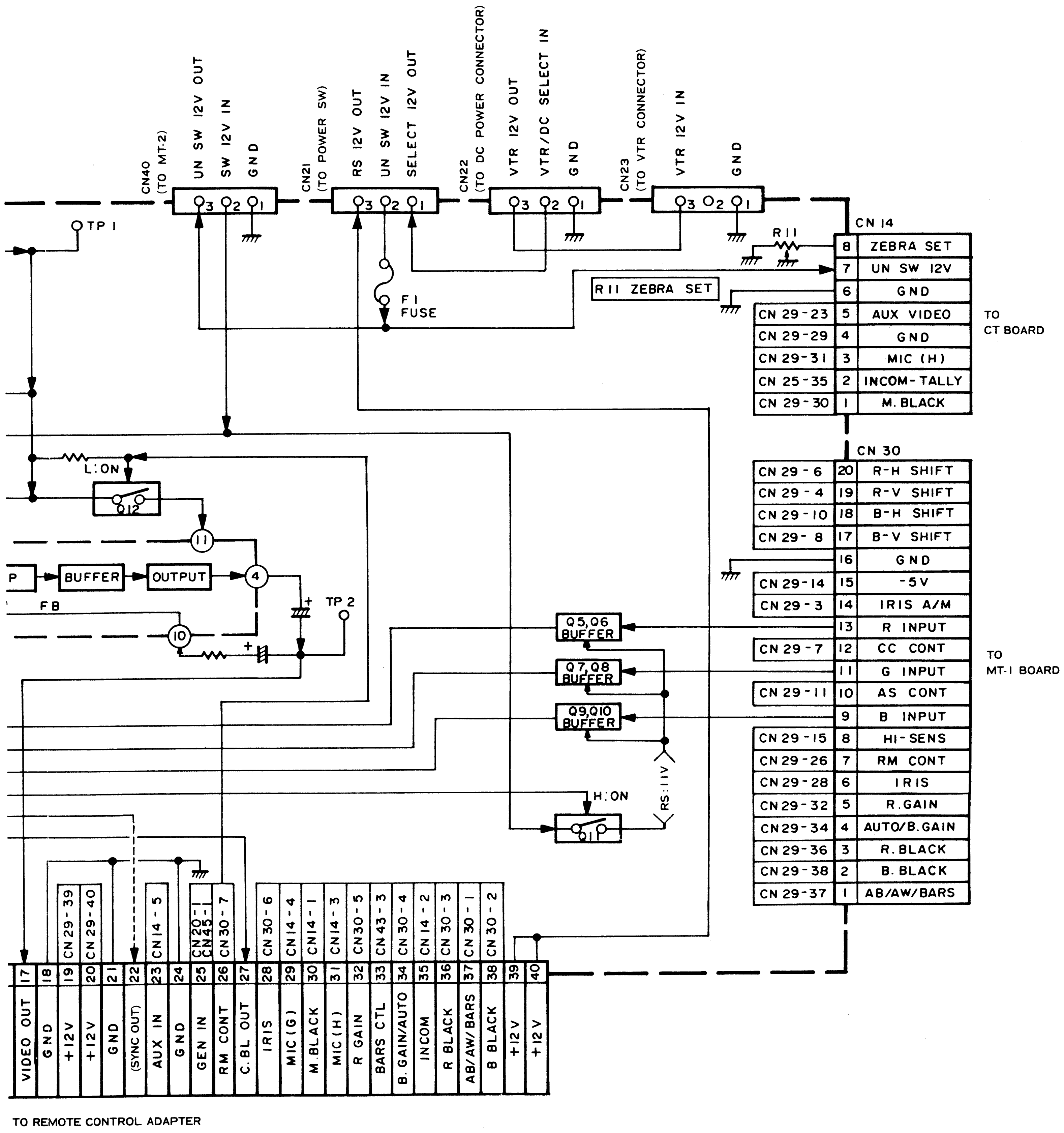

R23 18K
R68 10K
IC1-B
C6 10/25
R14 10K
C8 47/10
R13 50K
R13 M. BLACK
R74 15K
R72 8.2K
Q12
R70 82K
C29 0.01
R71 22K
Q10
R73 4.7K
R75 5.6K
R69 39K
IC5 SCV0478
R23 100K
IC9 SCV0689
C9 10/16
S4
VTR L↔B
CN14 (TO RC BOARD)
1 M-BLACK
2 TALLY CTL
3 AUDIO OUT
4 GND
5 AUX VIDEO IN
6 GND
7 UNSW 12V
8 ZEBRA SET
CN 24
1 EARPHONE
2 GND
R41 27K
R42 22K
R43 1.5K
R44 6.8K
R63 1.5K
R65 12K
Q5
Q6
Q4
R64 1K
R66 4.7K
C17 47 6.3
R67 4.7K
C16 47/6.3
R35 12K
R38 5.6K
R37 470
R36 470
IC7 SCV0473
C13 3P
R34 82K
R39 8.2K
C19 1/50
C18 220/10
C24 120P
C28 10/25
R50 10K
R53 100K
C22 0.0068
C23 1/50
IC8 μPC592H2
R49 560
R51 8.2K
C25 10/25
C26 47/10
R52 1K
C27 47/10
CN13 TO VTR CONNECTOR
12 AUDIO/SAVE
11 VTR TRIG
10 VTR ALARM
9 CFP OUT
8 BATT. ALARM
7 AUX/BAT ALARM
6 GND
5 GND
4 VIDEO
3 GND
2 MIC (H)
1 MIC (C)
R47 68
R40 75
dB 70 ⟺ 20 dB
R54 560
S3
R48 220
C21 10/25
CN15 TO PHANTOM MIC-6P
5 GND
4 MIC IN (C)
3 MIC IN (H)
2 GND
1 +9V INPUT
CN16 TO XLR-3 MIC
1 GND
2 MIC IN (C)
3 MIC IN (H)
CN43
1 TEST OUT
2 SHIELD

7.29 CT CIRCUIT BOARD

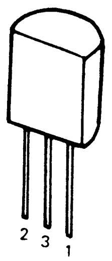

M.BLACK
B-G/ENC/R-G
ENC/AUX/R,G,B
VTR SELECT (L/B)
MIC LEVEL (HIGH/LOW)
HIGH
AUDIO
LOW

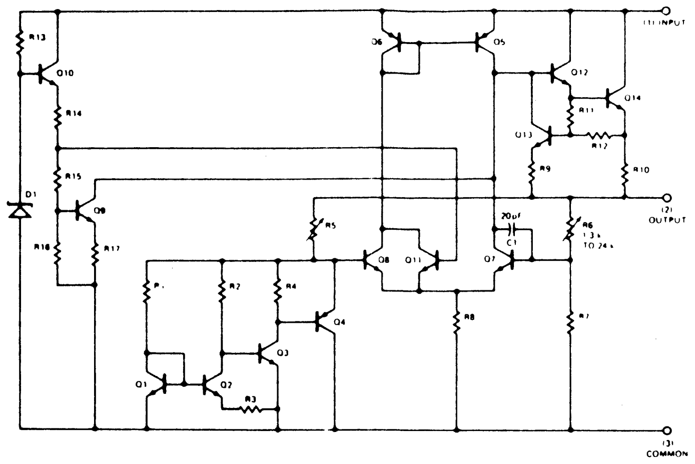
7.30 REAR CONTROL PANEL BLOCK DIAGRAM (RC BOARD)


CN40 (TO MT-2)
UN SW 12V OUT
SW 12V IN
GND
CN21 (TO POWER SW)
RS 12V OUT
UN SW 12V IN
SELECT 12V OUT
CN22 (TO DC POWER CONNECTOR)
VTR 12V OUT
VTR/DC SELECT IN
GND
CN23 (TO VTR CONNECTOR)
VTR 12V IN
GND
3 2 1
TP 1
Q1 9V REG
IC 1
8V REG
Q3 BUFFER
IC 2
COMP.
Q2 DRIVE
R7
R7 +9V ADJ
F1 FUSE
R11
R11 ZEBRA SET
CN 14
8 ZEBRA SET
7 UN SW 12V
6 GND
CN 29-23 5 AUX VIDEO
CN 29-29 4 GND
CN 29-31 3 MIC (H)
CN 25-35 2 INCOM-TALLY
CN 29-30 1 M. BLACK
TO CT BOARD
CN 30
CN 29-6 20 R-H SHIFT
CN 29-4 19 R-V SHIFT
CN 29-10 18 B-H SHIFT
CN 29-8 17 B-V SHIFT
16 GND
CN 29-14 15 -5V
CN 29-3 14 IRIS A/M
13 R INPUT
CN 29-7 12 CC CONT
11 G INPUT
CN 29-11 10 AS CONT
9 B INPUT
CN 29-15 8 HI-SENS
CN 29-26 7 RM CONT
CN 29-28 6 IRIS
CN 29-32 5 R.GAIN
CN 29-34 4 AUTO/B.GAIN
CN 29-36 3 R.BLACK
CN 29-38 2 B.BLACK
CN 29-37 1 AB/AW/BARS
TO MT-1 BOARD
CN 43
SYNC IN 1
C.BL IN 2
BARS CTL 3 CN 29-33
CN 24
H. PHASE 8 CN 29-12
SW 12V 7
GND 6
VIDEO IN 5
DEF 9V 4
VIDEO 9V 3
GND 2
GND 1
TO MT-1 BOARD
CN 45
GENLOCK IN 1 CN 20-1 CN 29-25
GND 2
TO GENLOCK CONNECTOR (BNC)
Q14 BUFFER
Q13 BUFFER
Q4 BUFFER
IC 3
AMP
BUFFER
OUTPUT
FB
7
11
4
10
L:ON
Q12
TP 2
Q5,Q6 BUFFER
Q7,Q8 BUFFER
Q9,Q10 BUFFER
H:ON
Q11
RS:11V
-5V
CN 20 (TO MT-1)
CN 45-1 CN 29-25
2 GND
1 GENLOCK OUT
CN 29
1 GND
2 GND
3 IRIS A/M CN 30-14
4 R-V SHIFT CN 30-19
5 R OUT
6 R-H SHIFT CN 30-20
7 CC CONT CN 30-12
8 B-V SHIFT CN 30-17
9 G OUT
10 B-H SHIFT CN 30-18
11 AS CONT CN 30-10
12 H.PHASE CN 24-8
13 B OUT
14 LEVEL CONT CN 30-15
15 HI-SENS CN 30-8
16 RS 9V IN
17 VIDEO OUT
18 GND
19 +12V CN 29-39
20 +12V CN 29-40
21 GND
22 (SYNC OUT)
23 AUX IN CN 14-5
24 GND
25 GEN IN CN 20-1 CN 45-1
26 RM CONT CN 30-7
27 C.BL OUT
28 IRIS CN 30-6
29 MIC (G) CN 14-4
30 M.BLACK CN 14-1
31 MIC (H) CN 14-3
32 R GAIN CN 30-5
33 BARS CTL CN 43-3
34 B.GAIN/AUTO CN 30-4
35 INCOM CN 14-2
36 R BLACK CN 30-3
37 AB/AW/BARS CN 30-1
38 B BLACK CN 30-2
39 +12V
40 +12V
TO REMOTE CONTROL ADAPTER

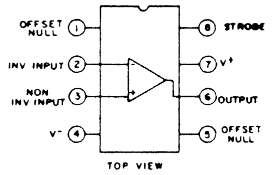

CN40 (TO MT-2)
UN SW 12V OUT
SW 12V IN
GND
CN21 (TO POWER SW)
RS 12V OUT
UN SW 12V IN
SELECT 12V OUT
CN22 (TO DC POWER CONNECTOR)
VTR 12V OUT
VTR/DC SELECT IN
GND
CN23 (TO VTR CONNECTOR)
VTR 12V IN
GND
TP 1
F1 FUSE
R11
R11 ZEBRA SET
CN 14
8 ZEBRA SET
7 UN SW 12V
6 GND
CN 29-23 5 AUX VIDEO
CN 29-29 4 GND
CN 29-31 3 MIC (H)
CN 25-35 2 INCOM-TALLY
CN 29-30 1 M. BLACK
TO CT BOARD
CN 30
CN 29-6 20 R-H SHIFT
CN 29-4 19 R-V SHIFT
CN 29-10 18 B-H SHIFT
CN 29-8 17 B-V SHIFT
16 GND
CN 29-14 15 -5V
CN 29-3 14 IRIS A/M
13 R INPUT
CN 29-7 12 CC CONT
11 G INPUT
CN 29-11 10 AS CONT
9 B INPUT
CN 29-15 8 HI-SENS
CN 29-26 7 RM CONT
CN 29-28 6 IRIS
CN 29-32 5 R.GAIN
CN 29-34 4 AUTO/B.GAIN
CN 29-36 3 R.BLACK
CN 29-38 2 B.BLACK
CN 29-37 1 AB/AW/BARS
TO MT-1 BOARD
L:ON
Q12
11
P
BUFFER
OUTPUT
4
FB
10
TP 2
Q5,Q6 BUFFER
Q7,Q8 BUFFER
Q9,Q10 BUFFER
RS: 11V
H:ON
Q11
CN 29-39
CN 29-40
CN 14-5
CN 20-1
CN 45-1
CN 30-7
CN 30-6
CN 14-4
CN 14-1
CN 14-3
CN 30-5
CN 43-3
CN 30-4
CN 14-2
CN 30-3
CN 30-1
CN 30-2
17 VIDEO OUT
18 GND
19 +12V
20 +12V
21 GND
22 (SYNC OUT)
23 AUX IN
24 GND
25 GEN IN
26 RM CONT
27 C.BL OUT
28 IRIS
29 MIC (G)
30 M.BLACK
31 MIC (H)
32 R GAIN
33 BARS CTL
34 B. GAIN/AUTO
35 INCOM
36 R BLACK
37 AB/AW/BARS
38 B BLACK
39 +12V
40 +12V
TO REMOTE CONTROL ADAPTER

TA78L008AP (Voltage Regulator 8 V) [TOSHIBA]



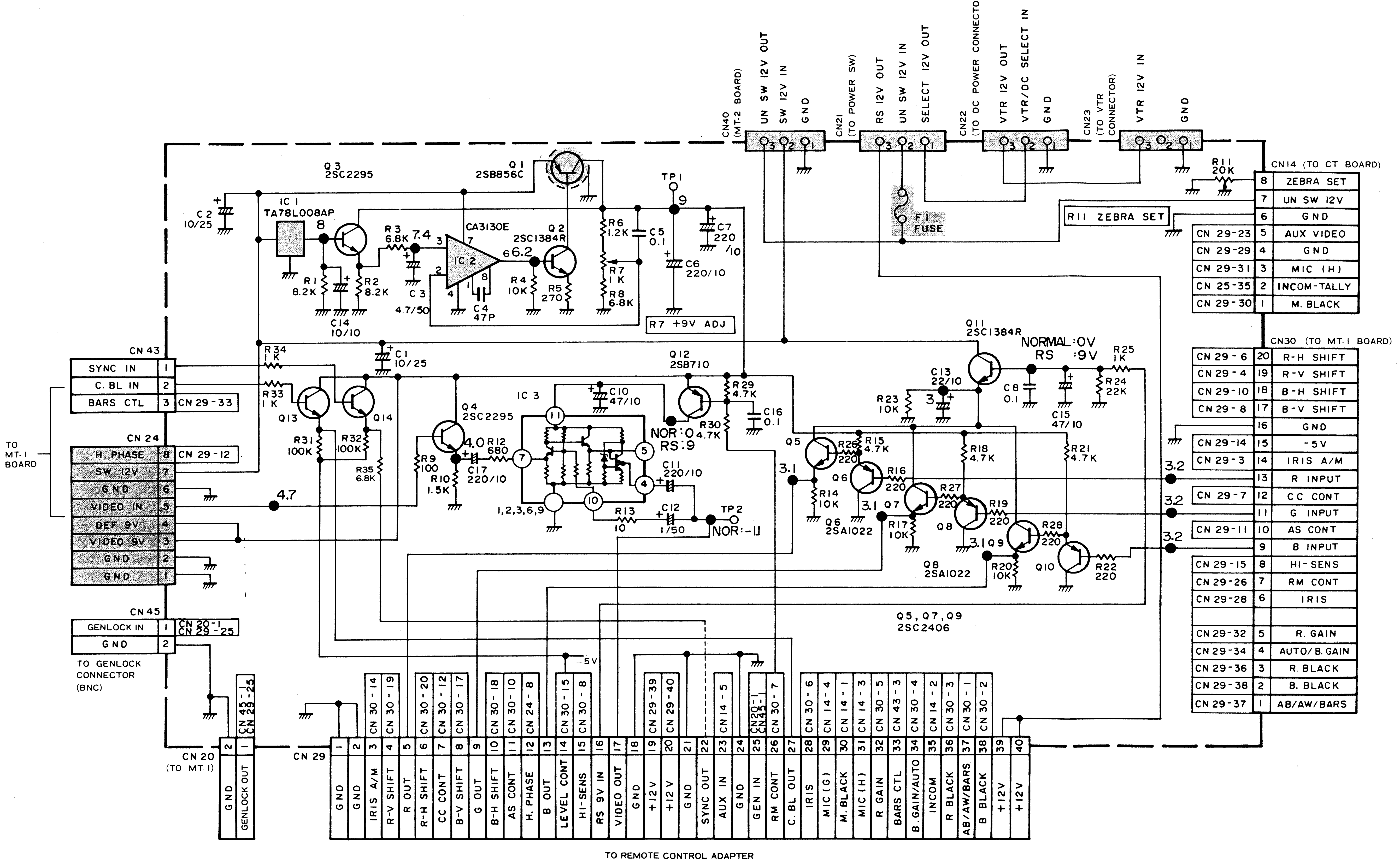

(1) INPUT
(2) OUTPUT
(3) COMMON
R13
Q10
R14
R15
D1
Q9
R16
R17
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q11
Q12
Q13
Q14
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
20pF
C1

CA3130E (Op. Amp) [RCA]

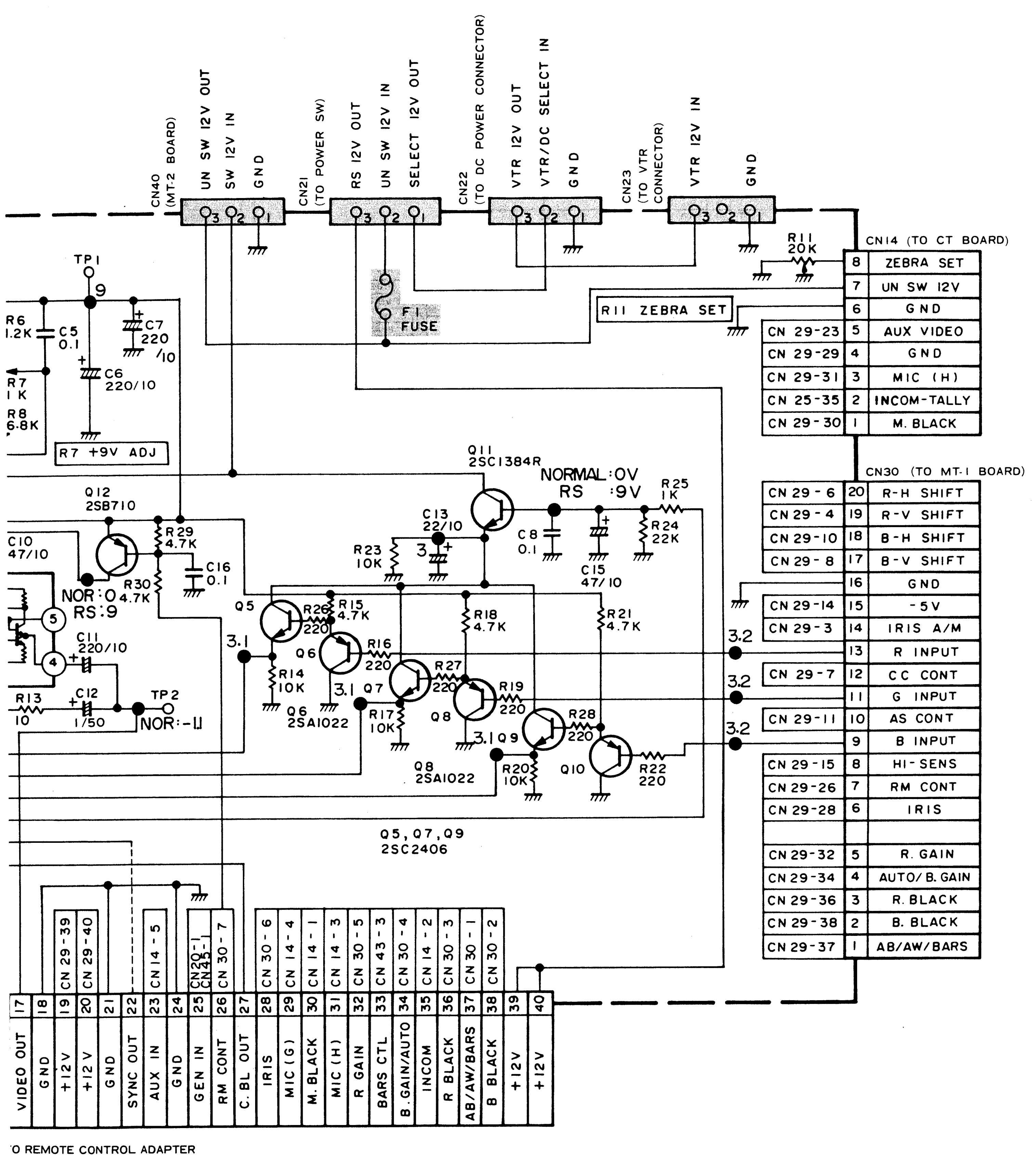

OFFSET NULL 1
INV INPUT 2
NON INV INPUT 3
V- 4
8 STROBE
7 V+
6 OUTPUT
5 OFFSET NULL
TOP VIEW

A B C D E F G H

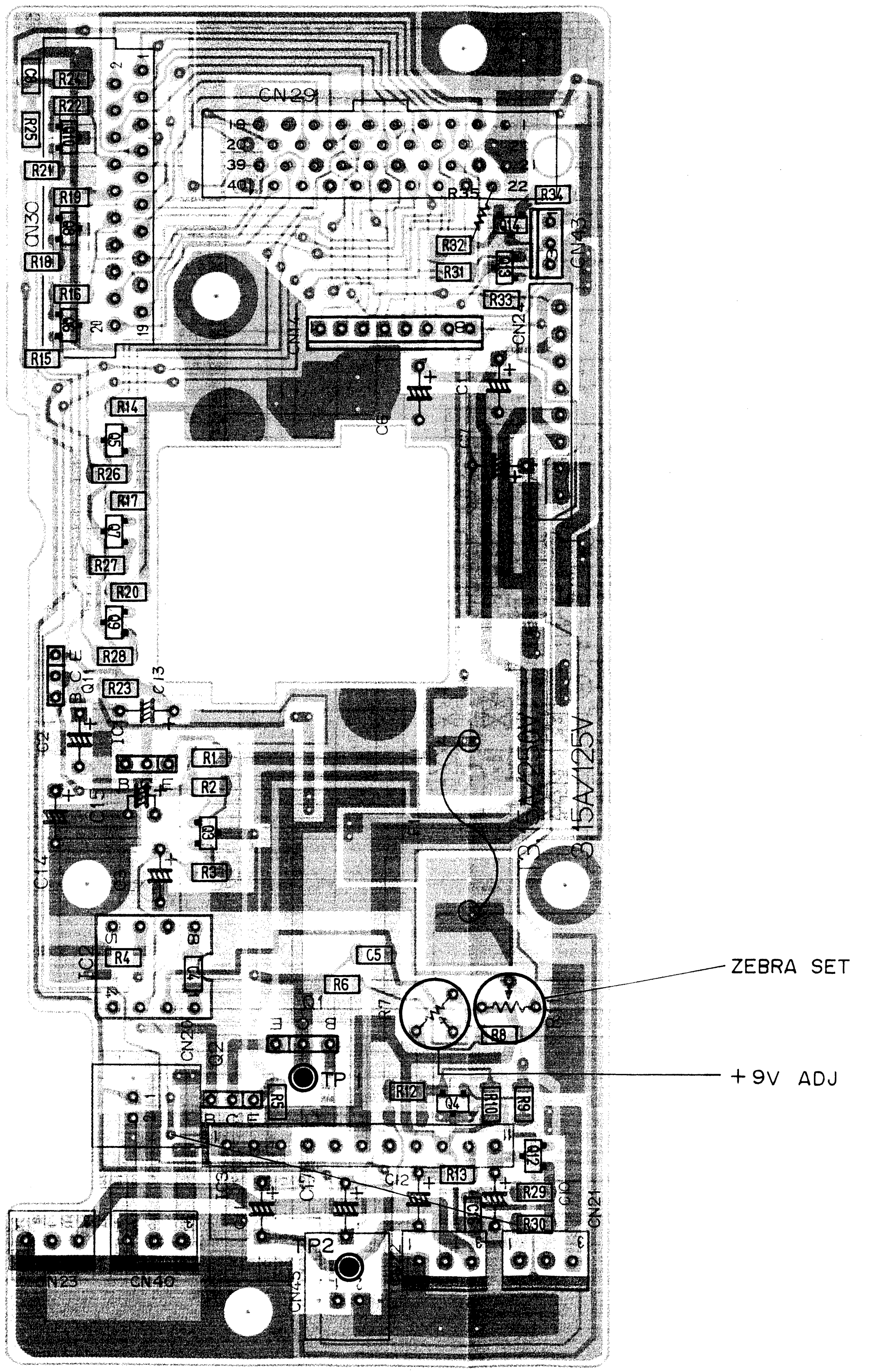
7.31 RC BOARD SCHEMATIC DIAGRAM


CN40 (MT-2 BOARD)
UN SW 12V OUT
SW 12V IN
GND
CN21 (TO POWER SW)
RS 12V OUT
UN SW 12V IN
SELECT 12V OUT
CN22 (TO DC POWER CONNECTOR)
VTR 12V OUT
VTR/DC SELECT IN
GND
CN23 (TO VTR CONNECTOR)
VTR 12V IN
GND
F1 FUSE
R11 20K
R11 ZEBRA SET
CN14 (TO CT BOARD)
8 ZEBRA SET
7 UN SW 12V
6 GND
CN 29-23 5 AUX VIDEO
CN 29-29 4 GND
CN 29-31 3 MIC (H)
CN 25-35 2 INCOM-TALLY
CN 29-30 1 M. BLACK
CN30 (TO MT-1 BOARD)
CN 29-6 20 R-H SHIFT
CN 29-4 19 R-V SHIFT
CN 29-10 18 B-H SHIFT
CN 29-8 17 B-V SHIFT
16 GND
CN 29-14 15 -5V
CN 29-3 14 IRIS A/M
13 R INPUT
CN 29-7 12 CC CONT
11 G INPUT
CN 29-11 10 AS CONT
9 B INPUT
CN 29-15 8 HI-SENS
CN 29-26 7 RM CONT
CN 29-28 6 IRIS
CN 29-32 5 R. GAIN
CN 29-34 4 AUTO/B. GAIN
CN 29-36 3 R. BLACK
CN 29-38 2 B. BLACK
CN 29-37 1 AB/AW/BARS
Q3 2SC2295
Q1 2SB856C
IC1 TA78L008AP
CA3130E
IC2
Q2 2SC1384R
TP1 9
8
7.4
6.2
C2 10/25
R1 8.2K
R2 8.2K
R3 6.8K
C3 4.7/50
C4 47P
C14 10/10
R4 10K
R5 270
R6 1.2K
R7 1K
R8 6.8K
C5 0.1
C6 220/10
C7 220/10
R7 +9V ADJ
CN 43
SYNC IN 1
C. BL IN 2
BARS CTL 3 CN 29-33
CN 24
H. PHASE 8 CN 29-12
SW 12V 7
GND 6
VIDEO IN 5
DEF 9V 4
VIDEO 9V 3
GND 2
GND 1
TO MT-1 BOARD
CN45
GENLOCK IN 1 CN 20-1 CN 29-25
GND 2
TO GENLOCK CONNECTOR (BNC)
R34 1K
R33 1K
C1 10/25
Q13
Q14
R31 100K
R32 100K
R35 6.8K
4.7
Q4 2SC2295
4.0
R9 100
R10 1.5K
R12 680
C17 220/10
IC 3
C10 47/10
1,2,3,6,9
R13 10
C11 220/10
C12 1/50
TP2
NOR:-1.1
Q12 2SB710
NOR:0 RS:9
R29 4.7K
R30 4.7K
C16 0.1
Q11 2SC1384R
NORMAL:0V RS :9V
R25 1K
R24 22K
C8 0.1
C15 47/10
C13 22/10
R23 10K
3
Q5
R26 220
R15 4.7K
3.1
Q6
R16 220
R14 10K
Q6 2SA1022
3.1 Q7
R17 10K
R27 220
R18 4.7K
Q8
R19 220
3.1 Q9
R20 10K
Q8 2SA1022
R21 4.7K
R28 220
Q10
R22 220
3.2
3.2
3.2
Q5, Q7, Q9 2SC2406
-5V
CN 20 (TO MT-1)
1 GENLOCK OUT CN 45-1 CN 29-25
2 GND
CN 29
1 GND
2 GND
3 IRIS A/M CN 30-14
4 R-V SHIFT CN 30-19
5 R OUT
6 R-H SHIFT CN 30-20
7 CC CONT CN 30-12
8 B-V SHIFT CN 30-17
9 G OUT
10 B-H SHIFT CN 30-18
11 AS CONT CN 30-10
12 H. PHASE CN 24-8
13 B OUT
14 LEVEL CONT CN 30-15
15 HI-SENS CN 30-8
16 RS 9V IN
17 VIDEO OUT
18 GND
19 +12V CN 29-39
20 +12V CN 29-40
21 GND
22 SYNC OUT
23 AUX IN CN 14-5
24 GND
25 GEN IN CN20-1 CN45-1
26 RM CONT CN 30-7
27 C. BL OUT
28 IRIS CN 30-6
29 MIC (G) CN 14-4
30 M. BLACK CN 14-1
31 MIC (H) CN 14-3
32 R GAIN CN 30-5
33 BARS CTL CN 43-3
34 B. GAIN/AUTO CN 30-4
35 INCOM CN 14-2
36 R BLACK CN 30-3
37 AB/AW/BARS CN 30-1
38 B BLACK CN 30-2
39 +12V
40 +12V
TO REMOTE CONTROL ADAPTER

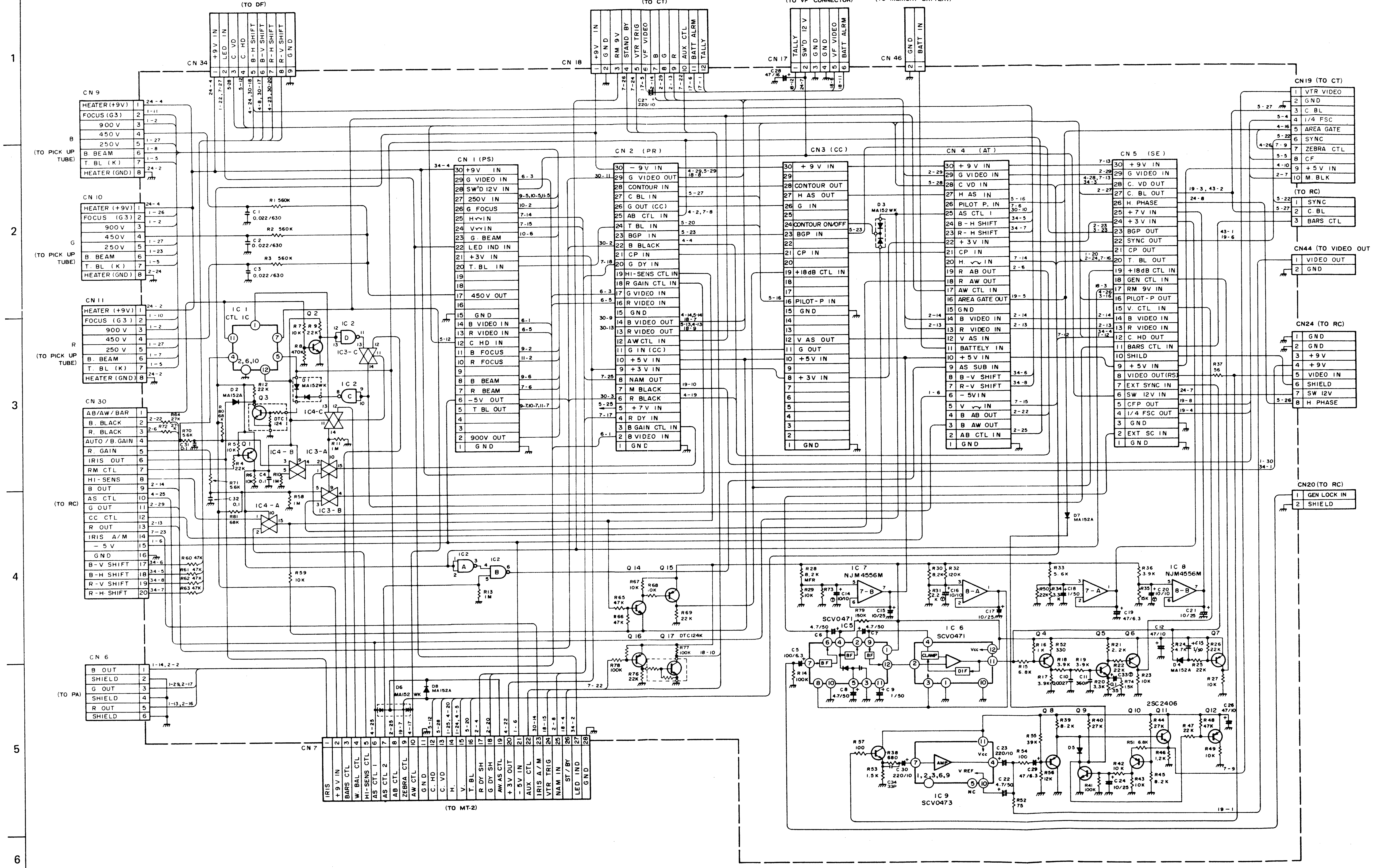
1
2
3
4
5
6

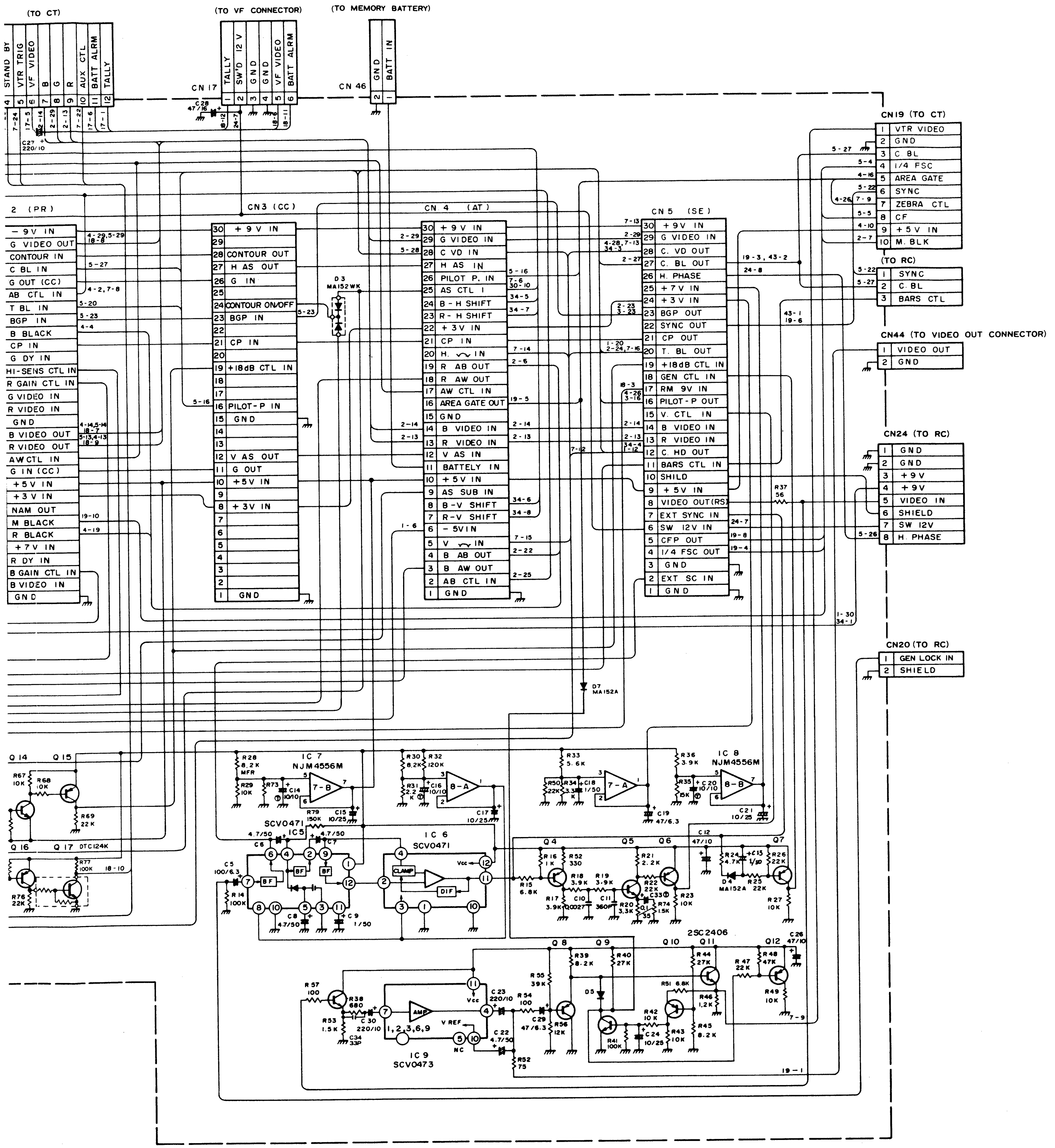

CN40 (MT-2 BOARD)
UN SW 12V OUT
SW 12V IN
GND
CN21 (TO POWER SW)
RS 12V OUT
UN SW 12V IN
SELECT 12V OUT
CN22 (TO DC POWER CONNECTOR)
VTR 12V OUT
VTR/DC SELECT IN
GND
CN23 (TO VTR CONNECTOR)
VTR 12V IN
GND
F1 FUSE
R11 20K
R11 ZEBRA SET
CN14 (TO CT BOARD)
8 ZEBRA SET
7 UN SW 12V
6 GND
CN 29-23 5 AUX VIDEO
CN 29-29 4 GND
CN 29-31 3 MIC (H)
CN 25-35 2 INCOM-TALLY
CN 29-30 1 M. BLACK
CN30 (TO MT-1 BOARD)
CN 29-6 20 R-H SHIFT
CN 29-4 19 R-V SHIFT
CN 29-10 18 B-H SHIFT
CN 29-8 17 B-V SHIFT
16 GND
CN 29-14 15 -5V
CN 29-3 14 IRIS A/M
13 R INPUT
CN 29-7 12 CC CONT
11 G INPUT
CN 29-11 10 AS CONT
9 B INPUT
CN 29-15 8 HI-SENS
CN 29-26 7 RM CONT
CN 29-28 6 IRIS
CN 29-32 5 R. GAIN
CN 29-34 4 AUTO/B. GAIN
CN 29-36 3 R. BLACK
CN 29-38 2 B. BLACK
CN 29-37 1 AB/AW/BARS
TP1 9
R6 1.2K
C5 0.1
C7 220/10
C6 220/10
R7 1K
R8 6.8K
R7 +9V ADJ
Q11 2SC1384R
NORMAL: 0V
RS : 9V
R25 1K
R24 22K
C8 0.1
C15 47/10
C13 22/10
R23 10K
Q12 2SB710
R29 4.7K
C16 0.1
C10 47/10
R30 4.7K
NOR: 0
RS: 9
C11 220/10
R13 10
C12 1/50
TP2
NOR: -11
Q5
R26 220
R15 4.7K
Q6
R16 220
R14 10K
Q6 2SA1022
Q7
R17 10K
R18 4.7K
R27 220
Q8
R19 220
Q8 2SA1022
Q9
R28 220
R20 10K
Q10
R21 4.7K
R22 220
Q5, Q7, Q9 2SC2406
3.1
3.2
CN 29-39
CN 29-40
CN 14-5
CN20-1 CN45-1
CN 30-7
CN 30-6
CN 14-4
CN 14-1
CN 14-3
CN 30-5
CN 43-3
CN 30-4
CN 14-2
CN 30-3
CN 30-1
CN 30-2
17 VIDEO OUT
18 GND
19 +12V
20 +12V
21 GND
22 SYNC OUT
23 AUX IN
24 GND
25 GEN IN
26 RM CONT
27 C. BL OUT
28 IRIS
29 MIC (G)
30 M. BLACK
31 MIC (H)
32 R GAIN
33 BARS CTL
34 B. GAIN/AUTO
35 INCOM
36 R BLACK
37 AB/AW/BARS
38 B BLACK
39 +12V
40 +12V
'O REMOTE CONTROL ADAPTER

7.32 RC CIRCUIT BOARD

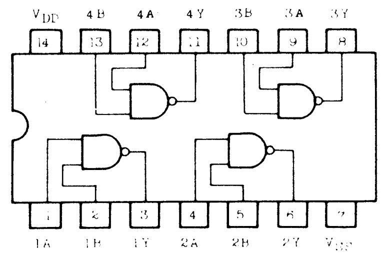

CN29
CN30
CN43
CN2
CN20
CN21
CN23
CN40
CN45
TP
TP2
ZEBRA SET
+9V ADJ
125V
250V

7.33 MT-1 SCHEMATIC DIAGRAM

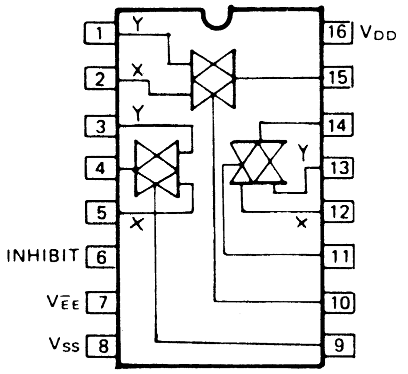

A
B
C
D
E
F
G
H
1
2
3
4
5
6
(TO DF)
CN 34
+9V IN
LED IN
C VD
C HD
B-H SHIFT
B-V SHIFT
R-H SHIFT
R-V SHIFT
GND
(TO CT)
CN 18
+9V IN
GND
RM 9V
STAND BY
VTR TRIG
VF VIDEO
G
B
R
AUX CTL
BATT ALRM
TALLY
(TO VF CONNECTOR)
CN 17
TALLY
SW'D 12 V
GND
GND
VF VIDEO
BATT ALRM
(TO MEMORY BATTERY)
CN 46
GND
BATT IN
CN 9
HEATER (+9V)
FOCUS (G3)
900 V
450 V
250 V
B BEAM
T. BL (K)
HEATER (GND)
B
(TO PICK UP TUBE)
CN 10
G
CN 11
R
CN 30
AB/AW/BAR
B. BLACK
R. BLACK
AUTO / B. GAIN
R. GAIN
IRIS OUT
RM CTL
HI-SENS
B OUT
AS CTL
G OUT
CC CTL
R OUT
IRIS A/M
-5 V
GND
B-V SHIFT
B-H SHIFT
R-V SHIFT
R-H SHIFT
(TO RC)
CN 6
B OUT
SHIELD
G OUT
SHIELD
R OUT
SHIELD
(TO PA)
CN 1 (PS)
+9V IN
G VIDEO IN
SW'D 12V IN
250V IN
G FOCUS
H∿IN
V∿IN
G. BEAM
LED IND IN
+3V IN
T. BL IN
450V OUT
GND
B VIDEO IN
R VIDEO IN
C HD IN
B FOCUS
R FOCUS
B BEAM
R BEAM
-5V OUT
T BL OUT
900V OUT
GND
CN 2 (PR)
-9V IN
G VIDEO OUT
CONTOUR IN
C BL IN
G OUT (CC)
AB CTL IN
T BL IN
BGP IN
B BLACK
CP IN
G DY IN
HI-SENS CTL IN
R GAIN CTL IN
G VIDEO IN
R VIDEO IN
GND
B VIDEO OUT
R VIDEO OUT
AW CTL IN
G IN (CC)
+5V IN
+3V IN
NAM OUT
M BLACK
R BLACK
+7V IN
R DY IN
B GAIN CTL IN
B VIDEO IN
GND
CN3 (CC)
+9V IN
CONTOUR OUT
H AS OUT
G IN
CONTOUR ON/OFF
BGP IN
CP IN
+18dB CTL IN
PILOT-P IN
GND
V AS OUT
G OUT
+5V IN
+3V IN
GND
D3 MA152WK
D7 MA152A
CN 4 (AT)
+9V IN
G VIDEO IN
C VD IN
H AS IN
PILOT P. IN
AS CTL I
B-H SHIFT
R-H SHIFT
+3V IN
CP IN
H. ∿ IN
R AB OUT
R AW OUT
AW CTL IN
AREA GATE OUT
GND
B VIDEO IN
R VIDEO IN
V AS IN
BATTELY IN
+5V IN
AS SUB IN
B-V SHIFT
R-V SHIFT
-5VIN
V ∿ IN
B AB OUT
B AW OUT
AB SC IN
GND
CN 5 (SE)
+9V IN
G VIDEO IN
C. VD OUT
C. BL OUT
H PHASE
+7V IN
+3V IN
BGP OUT
SYNC OUT
CP OUT
T. BL OUT
+18dB CTL IN
GEN CTL IN
RM 9V IN
PILOT-P OUT
V. CTL IN
B VIDEO IN
R VIDEO IN
C HD OUT
BARS CTL IN
SHILD
+5V IN
VIDEO OUT(RS)
EXT SYNC IN
SW 12V IN
CFP OUT
1/4 FSC OUT
GND
EXT SC IN
GND
CN19 (TO CT)
VTR VIDEO
GND
C BL
1/4 FSC
AREA GATE
SYNC
ZEBRA CTL
CF
+5V IN
M. BLK
(TO RC)
SYNC
C. BL
BARS CTL
CN44 (TO VIDEO OUT CO
VIDEO OUT
GND
CN24 (TO RC)
GND
GND
+9V
+9V
VIDEO IN
SHIELD
SW 12V
H PHASE
CN20 (TO RC)
GEN LOCK IN
SHIELD
IC 1 CTL IC
IC 2
IC3-C
IC4-C
IC4-B
IC3-A
IC3-B
IC4-A
Q1
Q2
Q3
D1 MA152WK
D2 MA152A
DTC124
R1 560K
C1 0.022/630
R2 560K
C2 0.022/630
R3 560K
C3 0.022/630
IC 7 NJM4556M
IC 8 NJM4556M
IC5 SCV0471
IC 6 SCV0471
IC 9 SCV0473
CLAMP
DIF
AMP
V REF
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
2SC2406
Q14
Q15
Q16
Q17 DTC124K
D6 MA152 WK
D8 MA152A
D4 MA152A
CN 7
IRIS
+9V IN
BARS CTL
W. BAL CTL
HI-SENS CTL
AS CTL I
AS CTL 2
AB CTL
ZEBRA CTL
AW CTL
GND
C. HD
C. VD
H.
V.
T. BL
R DY SH
G DY SH
AW AS CTL
+3V OUT
-5V IN
AUX CTL
IRIS A/M
VTR TRIG
NAM IN
ST/BY
LED IND
GND
(TO MT-2)


(TO CT)
STAND BY
VTR TRIG
VF VIDEO
B
G
R
AUX CTL
BATT ALRM
TALLY
(TO VF CONNECTOR)
CN 17
TALLY
SW'D 12 V
GND
GND
VF VIDEO
BATT ALRM
(TO MEMORY BATTERY)
CN 46
GND
BATT IN
C28 47/16
C27 220/10
2 (PR)
-9V IN
G VIDEO OUT
CONTOUR IN
C BL IN
G OUT (CC)
AB CTL IN
T BL IN
BGP IN
B BLACK
CP IN
G DY IN
HI-SENS CTL IN
R GAIN CTL IN
G VIDEO IN
R VIDEO IN
GND
B VIDEO OUT
R VIDEO OUT
AW CTL IN
G IN (CC)
+5V IN
+3V IN
NAM OUT
M BLACK
R BLACK
+7V IN
R DY IN
B GAIN CTL IN
B VIDEO IN
GND
CN3 (CC)
30 +9V IN
28 CONTOUR OUT
27 H AS OUT
26 G IN
24 CONTOUR ON/OFF
23 BGP IN
21 CP IN
19 +18dB CTL IN
16 PILOT-P IN
15 GND
12 V AS OUT
11 G OUT
10 +5V IN
8 +3V IN
1 GND
D3 MA152WK
CN 4 (AT)
30 +9V IN
29 G VIDEO IN
28 C VD IN
27 H AS IN
26 PILOT P. IN
25 AS CTL I
24 B-H SHIFT
23 R-H SHIFT
22 +3V IN
21 CP IN
20 H. ∿ IN
19 R AB OUT
18 R AW OUT
17 AW CTL IN
16 AREA GATE OUT
15 GND
14 B VIDEO IN
13 R VIDEO IN
12 V AS IN
11 BATTELY IN
10 +5V IN
9 AS SUB IN
8 B-V SHIFT
7 R-V SHIFT
6 -5VIN
5 V ∿ IN
4 B AB OUT
3 B AW OUT
2 AB CTL IN
1 GND
CN 5 (SE)
30 +9V IN
29 G VIDEO IN
28 C. VD OUT
27 C. BL OUT
26 H. PHASE
25 +7V IN
24 +3V IN
23 BGP OUT
22 SYNC OUT
21 CP OUT
20 T. BL OUT
19 +18dB CTL IN
18 GEN CTL IN
17 RM 9V IN
16 PILOT-P OUT
15 V. CTL IN
14 B VIDEO IN
13 R VIDEO IN
12 C. HD OUT
11 BARS CTL IN
10 SHILD
9 +5V IN
8 VIDEO OUT(RS)
7 EXT SYNC IN
6 SW 12V IN
5 CFP OUT
4 1/4 FSC OUT
3 GND
2 EXT SC IN
1 GND
CN19 (TO CT)
1 VTR VIDEO
2 GND
3 C BL
4 1/4 FSC
5 AREA GATE
6 SYNC
7 ZEBRA CTL
8 CF
9 +5V IN
10 M. BLK
(TO RC)
1 SYNC
2 C.BL
3 BARS CTL
CN44 (TO VIDEO OUT CONNECTOR)
1 VIDEO OUT
2 GND
CN24 (TO RC)
1 GND
2 GND
3 +9V
4 +9V
5 VIDEO IN
6 SHIELD
7 SW 12V
8 H. PHASE
CN20 (TO RC)
1 GEN LOCK IN
2 SHIELD
R37 56
D7 MA152A
Q14 Q15 Q16 Q17 DTC124K
R67 10K
R68 10K
R69 22K
R77 100K
R76 22K
IC 7 NJM4556M
7-B
R28 8.2K MFR
R29 10K
R73
C14 10/10
R79 150K
C15 10/25
SCV0471 IC5
4.7/50
C5 100/6.3
R14 100K
C6 C7 C8 4.7/50
C9 1/50
BF
IC 6 SCV0471
CLAMP
DIF
Vcc
R30 8.2K
R32 120K
R31 2.2K
C16 10/10
8-A
C17 10/25
R33 5.6K
R50 22K
R34 3.3K
C18 1/50
7-A
C19 47/6.3
R36 3.9K
IC 8 NJM4556M
R35 15K
C20 10/10
8-B
C21 10/25
Q4 Q5 Q6 Q7
R15 6.8K
R16 1K
R52 330
R17 3.9K
R18 3.9K
R19 3.9K
C10 0.027
C11 360P
R20 3.3K
R21 2.2K
R22 22K
C33
R74 1.5K
R23 10K
C12 47/10
R24 4.7K
C15 1/50
R26 22K
D4 MA152A
R25 22K
R27 10K
Q8 Q9 Q10 Q11 Q12
2SC2406
R57 100
R38 680
R53 1.5K
C30 220/10
C34 33P
AMP
1,2,3,6,9
IC 9 SCV0473
V REF
NC
C23 220/10
R54 100
C29 47/6.3
C22 4.7/50
R52 75
R55 39K
R56 12K
R39 8.2K
R40 27K
D5
R41 100K
C24 10/25
R42 10K
R43 10K
R51 6.8K
R44 27K
R46 1.2K
R45 8.2K
R47 22K
R48 47K
R49 10K
C26 47/10
19-1

TC40H000F (Quad Two Input HAND Gate) [TOSHIBA]

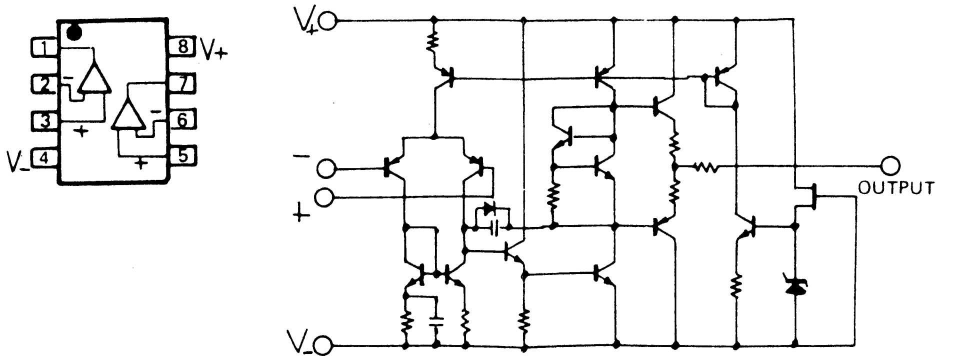

VDD 4B 4A 4Y 3B 3A 3Y
14 13 12 11 10 9 8
1 2 3 4 5 6 7
1A 1B 1Y 2A 2B 2Y VSS

TC4053BF (Multiplexer/Demultiplexer) [TOSHIBA]

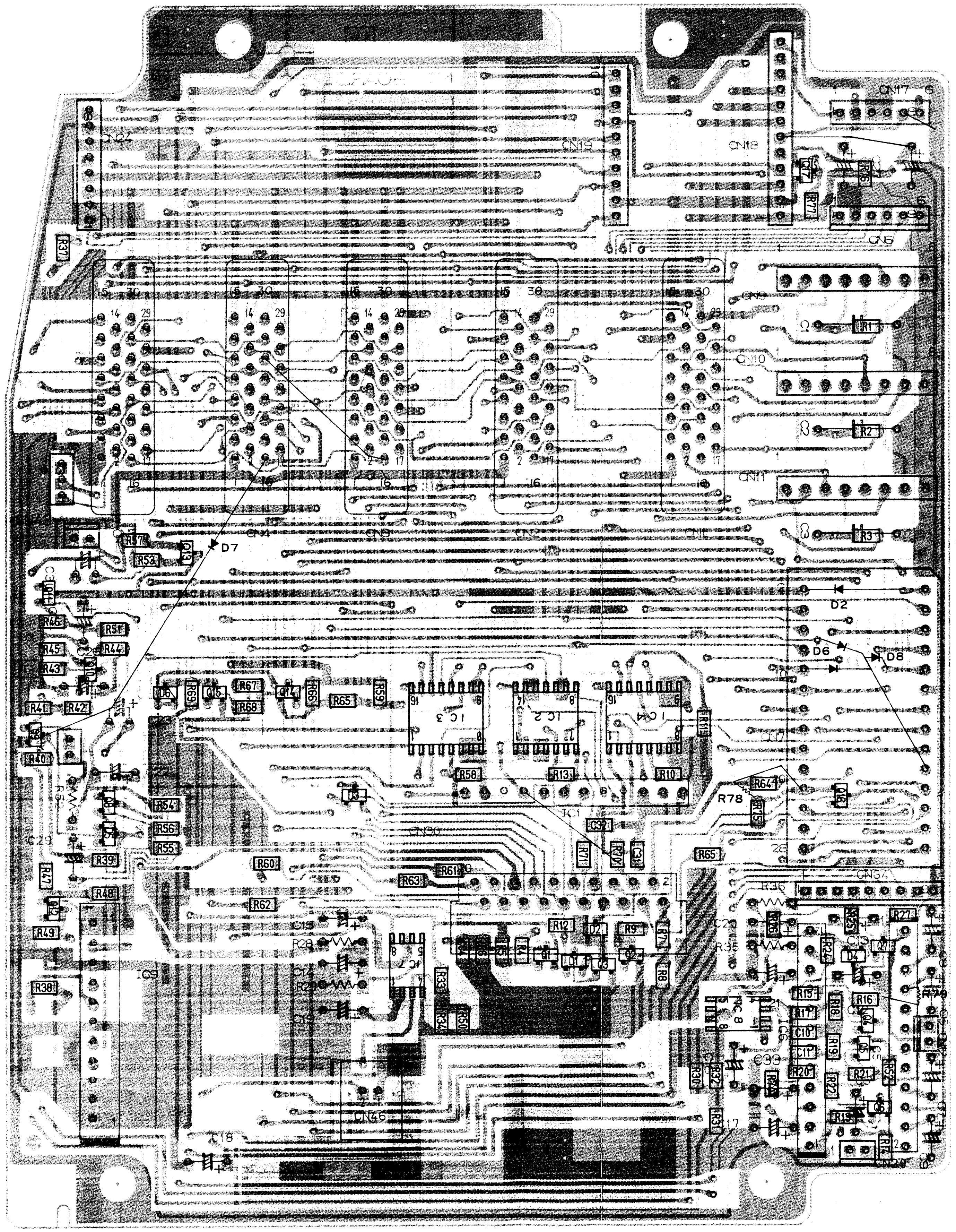

1
2
3
4
5
INHIBIT 6
VEE 7
VSS 8
16 VDD
15
14
13
12
11
10
9
Y
X
Y
X
Y
X

CONTROL H : Y OUTPUT

NJM4556M(Dual Op. Amp) [JRC]

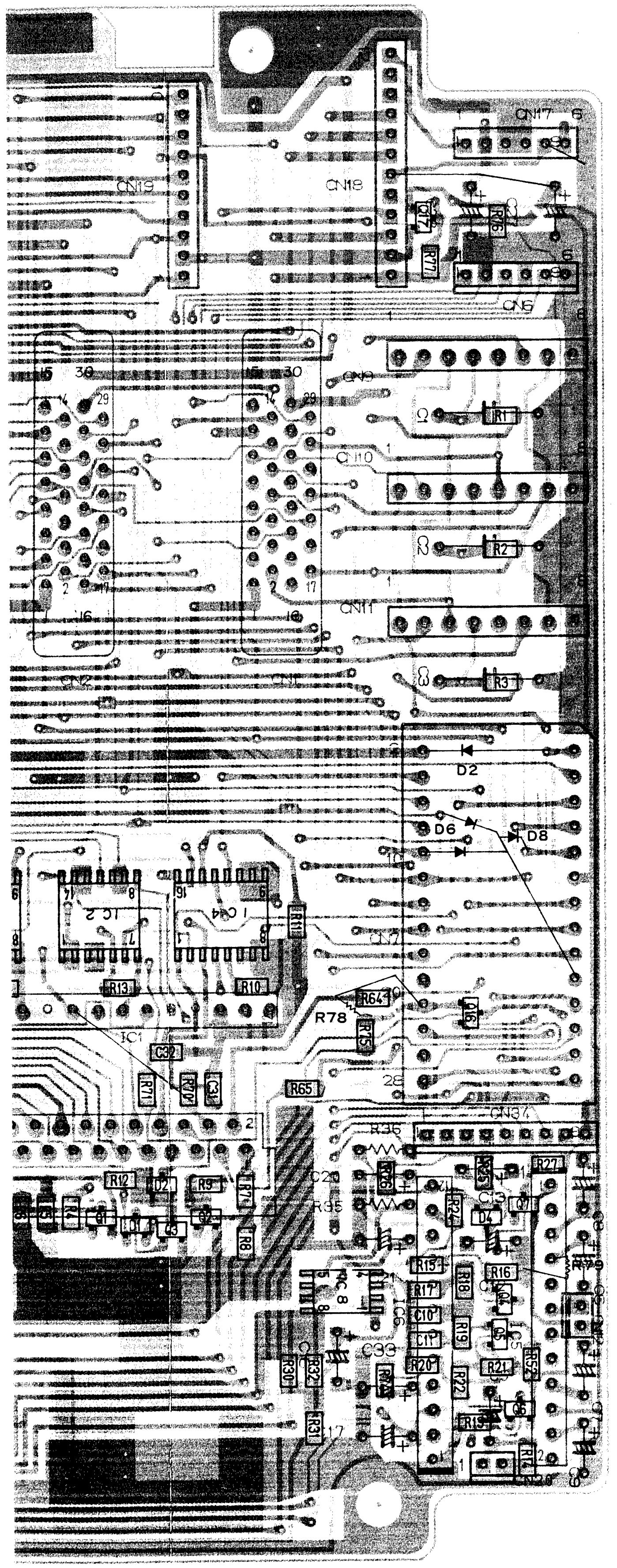

1
2
3
V- 4
8 V+
7
6
5
V+
-
+
V-
OUTPUT

7.34 MT-1 CIRCUIT BOARD

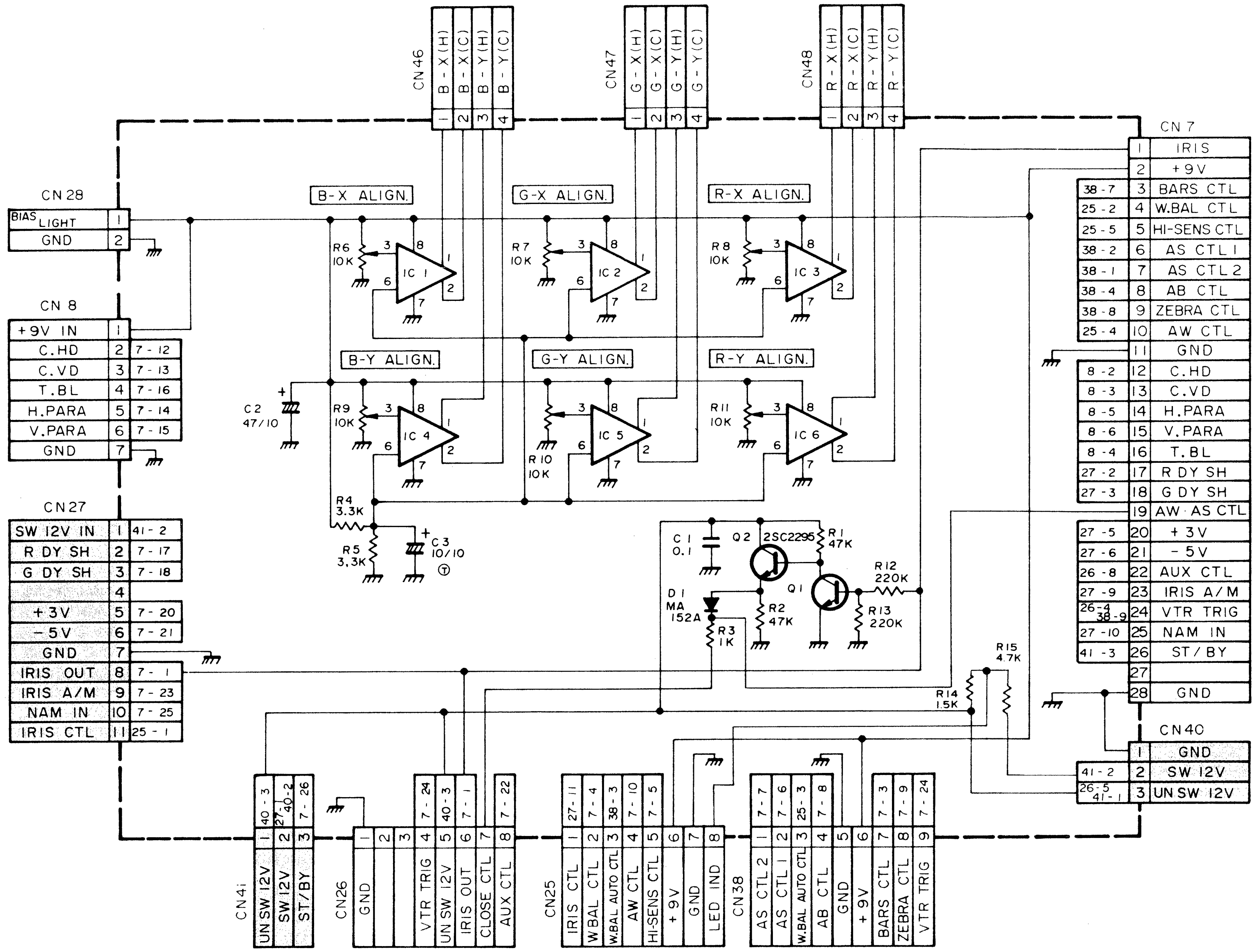

CN42
CN19
CN18
CN17
CN5
R37
CN9
CN10
CN11
R1
R2
R3
CN4
CN3
CN2
CN1
R57
R53
Q3
D7
C30
R46
R45
R43
R41
R42
R51
R44
D6
Q16
R69
R67
R68
Q14
R66
R65
R59
C23
R40
C22
R54
R56
R55
C29
R39
R47
R48
R49
R38
IC9
IC3
IC2
IC4
R11
R58
R13
R10
R64
R78
R75
IC1
C32
R71
R70
C31
R65
R60
R61
R63
R62
CN30
CN34
R36
C15
R28
C14
R29
C16
IC7
R33
R34
R50
R12
R9
R7
R8
C20
R35
R27
R26
R24
C13
D4
Q11
R15
R16
R17
R18
C10
R19
R20
R21
C33
R22
R32
R30
R31
R25
R52
R19
R14
CN20
CN46
C18
D2
D6
D8
R79
C17
IC8
R77
R76
R74

7-21 MT-1 BOARD
(MT-2, SW SCHEMATIC & BOARD)

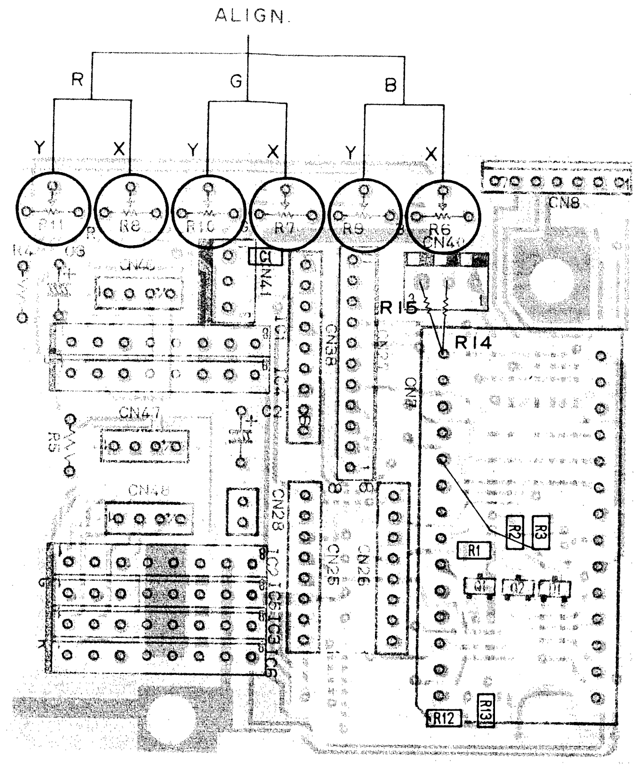
D E F G H I J K L


CN17
CN18
CN19
CN5
CN9
CN10
CN11
R1
R2
R3
D2
D6
D8
IC2
IC4
IC6
IC1
IC8
R13
R10
R11
R78
R64
R65
C32
CN34
R36
R35
R27
C13
R16
R15
R17
C10
C11
R18
R19
R20
R21
R22
C33
R30
R31
R12
R9
R8
R77
R14
R79
30
29
28
17
16
2
1

7.35 MT-2 SCHEMATIC DIAGRAM


CN46
B - X(H)
B - X(C)
B - Y(H)
B - Y(C)
CN47
G - X(H)
G - X(C)
G - Y(H)
G - Y(C)
CN48
R - X(H)
R - X(C)
R - Y(H)
R - Y(C)
CN28
BIAS LIGHT
GND
CN 8
+9V IN
C.HD 7-12
C.VD 7-13
T.BL 7-16
H.PARA 7-14
V.PARA 7-15
GND
CN27
SW 12V IN 41-2
R DY SH 7-17
G DY SH 7-18
+3V 7-20
-5V 7-21
GND
IRIS OUT 7-1
IRIS A/M 7-23
NAM IN 7-25
IRIS CTL 25-1
B-X ALIGN.
G-X ALIGN.
R-X ALIGN.
B-Y ALIGN.
G-Y ALIGN.
R-Y ALIGN.
R6 10K
R7 10K
R8 10K
R9 10K
R10 10K
R11 10K
IC 1
IC 2
IC 3
IC 4
IC 5
IC 6
C2 47/10
R4 3.3K
R5 3.3K
C3 10/10
C1 0.1
Q2 2SC2295
Q1
R1 47K
R2 47K
R3 1K
R12 220K
R13 220K
D1 MA 152A
R14 1.5K
R15 4.7K
CN 7
IRIS
+9V
38-7 BARS CTL
25-2 W.BAL CTL
25-5 HI-SENS CTL
38-2 AS CTL 1
38-1 AS CTL 2
38-4 AB CTL
38-8 ZEBRA CTL
25-4 AW CTL
GND
8-2 C.HD
8-3 C.VD
8-5 H.PARA
8-6 V.PARA
8-4 T.BL
27-2 R DY SH
27-3 G DY SH
AW AS CTL
27-5 +3V
27-6 -5V
26-8 AUX CTL
27-9 IRIS A/M
26-4 38-9 VTR TRIG
27-10 NAM IN
41-3 ST/BY
GND
CN40
GND
41-2 SW 12V
26-5 41-1 UN SW 12V
CN41
40-3 UN SW 12V
27-1 40-2 SW 12V
7-26 ST/BY
CN26
GND
7-24 VTR TRIG
40-3 UN SW 12V
7-1 IRIS OUT
CLOSE CTL
7-22 AUX CTL
CN25
27-11 IRIS CTL
7-4 W.BAL CTL
38-3 W.BAL AUTO CTL
7-10 AW CTL
7-5 HI-SENS CTL
+9V
GND
LED IND
CN38
7-7 AS CTL 2
7-6 AS CTL 1
25-3 W.BAL AUTO CTL
7-8 AB CTL
GND
+9V
7-3 BARS CTL
7-9 ZEBRA CTL
7-24 VTR TRIG

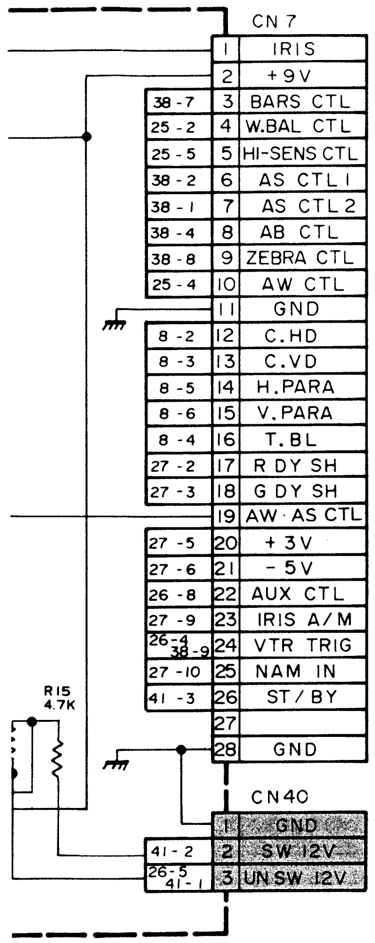
7.36 MT-2 CIRCUIT BOARD


ALIGN.
R
G
B
Y
X
Y
X
Y
X
R8
R10
R7
R9
R6
CN8
CN46
CN47
CN48
CN41
CN28
CN25
CN26
CN38
CN40
R15
R14
R1
R2
R3
R12
R13

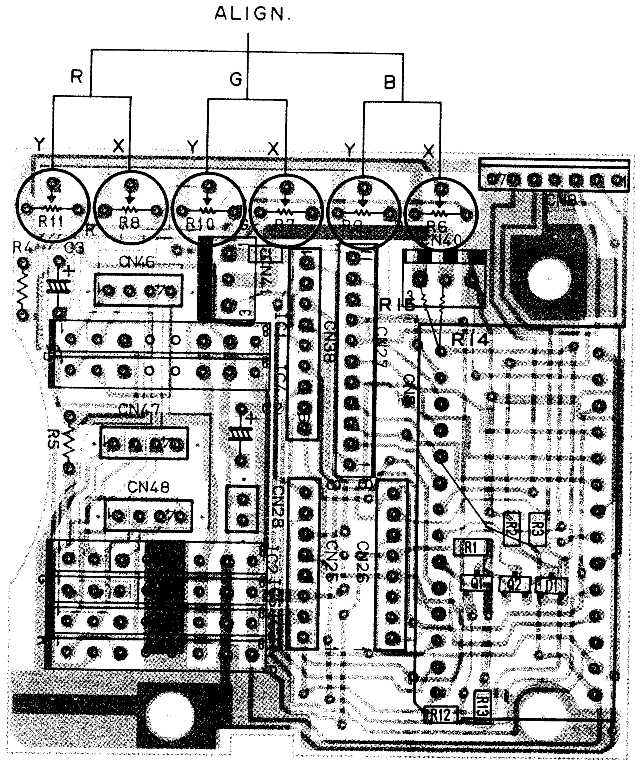
7.37

7.38

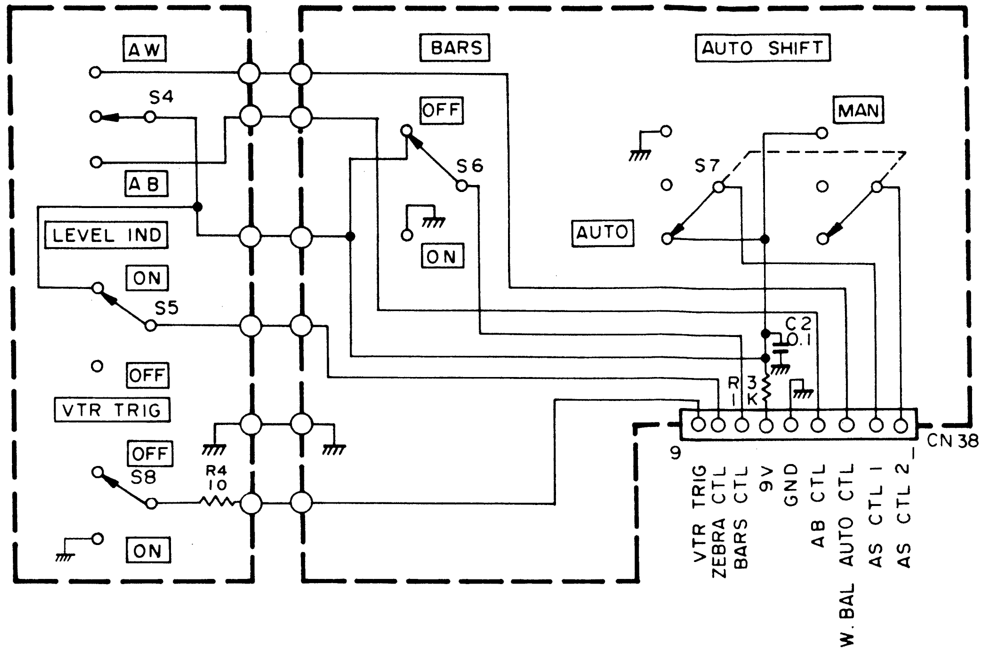
7.39


CN 7
1 IRIS
2 +9V
38-7 3 BARS CTL
25-2 4 W.BAL CTL
25-5 5 HI-SENS CTL
38-2 6 AS CTL 1
38-1 7 AS CTL 2
38-4 8 AB CTL
38-8 9 ZEBRA CTL
25-4 10 AW CTL
11 GND
8-2 12 C.HD
8-3 13 C.VD
8-5 14 H.PARA
8-6 15 V.PARA
8-4 16 T.BL
27-2 17 R DY SH
27-3 18 G DY SH
19 AW·AS CTL
27-5 20 +3V
27-6 21 -5V
26-8 22 AUX CTL
27-9 23 IRIS A/M
26-4 38-9 24 VTR TRIG
27-10 25 NAM IN
41-3 26 ST/BY
27
28 GND
R15 4.7K
CN40
1 GND
41-2 2 SW 12V
26-5 41-1 3 UN SW 12V

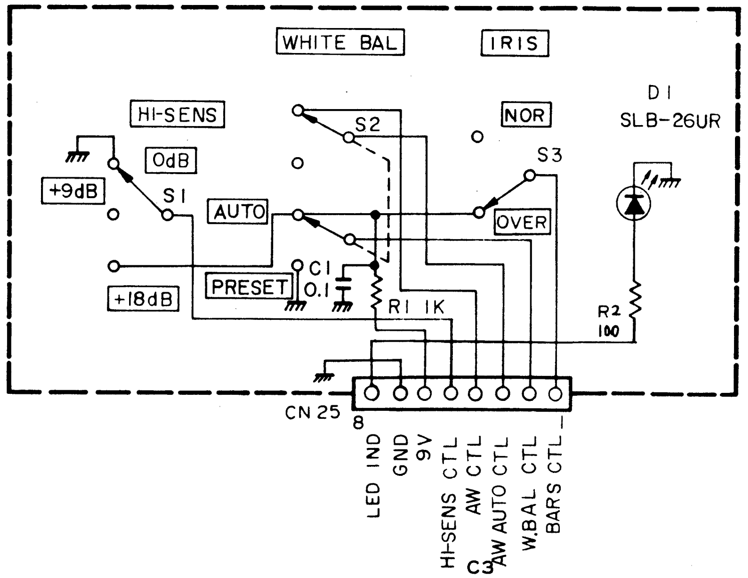
7.36 MT-2 CIRCUIT BOARD


ALIGN.
R
G
B
Y
X
Y
X
Y
X
R11
R8
R10
R7
R9
R6
R4
Q3
CN46
CN40
CN47
CN48
CN30
CN27
CN28
CN26
R5
R1
R14
R3
R2
VR1
R12
R13

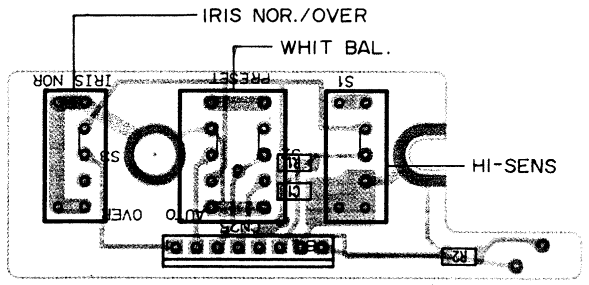
7.37 SW BLOCK DIAGRAM

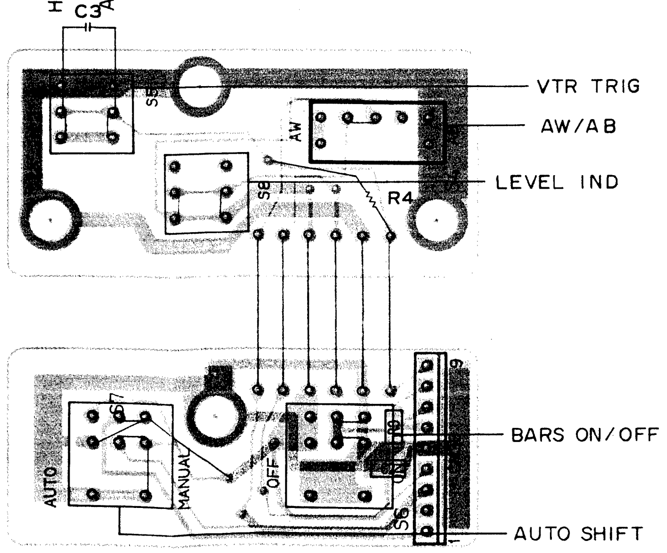

AW
S4
AB
LEVEL IND
ON
S5
OFF
VTR TRIG
OFF
S8
R4 10
ON
BARS
OFF
S6
ON
AUTO SHIFT
MAN
S7
AUTO
C2 0.1
R3 1K
9
CN38
VTR TRIG
ZEBRA CTL
BARS CTL
9V
GND
AB CTL
W. BAL AUTO CTL
AS CTL 1
AS CTL 2

7.38 SW SCHEMATIC DIAGRAM

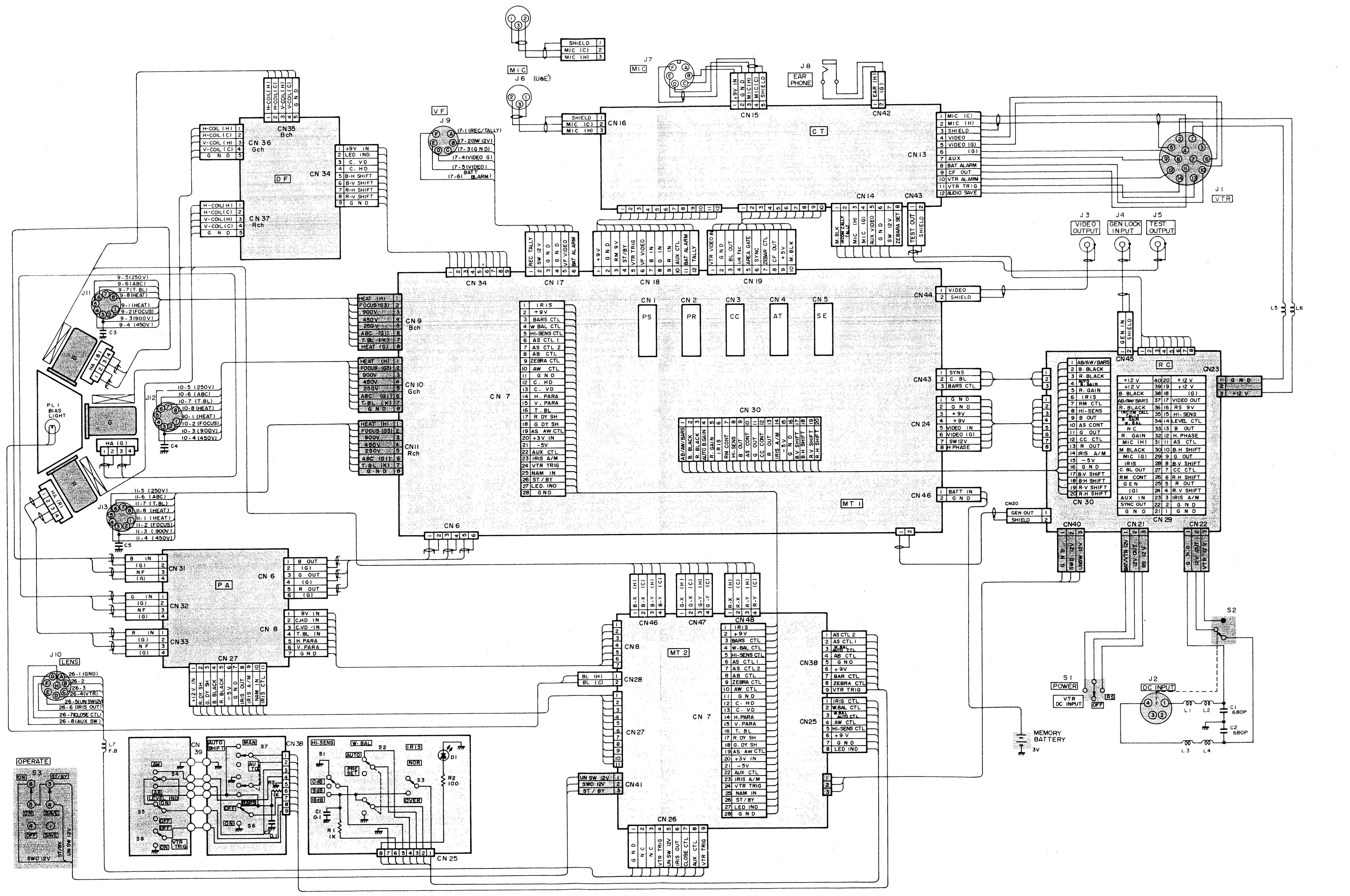

WHITE BAL
IRIS
HI-SENS
0dB
+9dB
S1
+18dB
S2
AUTO
PRESET
C1 0.1
R1 1K
NOR
S3
OVER
D1
SLB-26UR
R2 100
CN 25
8
LED IND
GND
9V
HI-SENS CTL
AW CTL
AW AUTO CTL
W.BAL CTL
BARS CTL

7.39 SW CIRCUIT BOARD


IRIS NOR./OVER
WHIT BAL.
HI-SENS
IRIS NOR
PRESET
S1
S2
OVER
AUTO
R2


C3
VTR TRIG
AW/AB
LEVEL IND
R4
S8
S4
AW
BARS ON/OFF
AUTO SHIFT
AUTO
S7
MANUAL
OFF
S6
9

7.40 OVERALL WIRINGS


A
B
C
D
E
F
G
H
1
2
3
4
5
6
DF
CN35 Bch
CN 36 Gch
CN 37 Rch
CN 34
VF
J 9
J6 (JPN)
J6 (U&E)
MIC
J7
J8
EAR PHONE
CN15
CN16
CN42
CT
CN13
CN14
CN43
J 1 VTR
J 3 VIDEO OUTPUT
J 4 GEN LOCK INPUT
J 5 TEST OUTPUT
CN 17
CN 18
CN 19
CN1 PS
CN 2 PR
CN 3 CC
CN 4 AT
CN 5 SE
CN44
CN45
CN 7
CN 9 Bch
CN10 Gch
CN11 Rch
CN 30
CN 24
CN 46
MT 1
CN 6
CN20
RC
CN23
CN29
CN40
CN21
CN22
L5
L6
J11
J12
J13
PL1 BIAS LIGHT
HA (B)
HA (G)
HA (R)
C3
C4
C5
PA
CN 31
CN 32
CN33
CN 8
CN 27
J10 LENS
L7 F.B
OPERATE
S3
CN 39
CN38
CN 25
S1
S2
S4
S5
S6
S7
S8
D1
R1 1K
R2 100
R3 1K
MT 2
CN46
CN47
CN48
CN28
CN27
CN41
CN26
CN38
CN25
S1 POWER
VTR DC INPUT
OFF
RS
S2
J2 DC INPUT
L1
L2
L3
L4
C1 680P
C2 680P
MEMORY BATTERY 3V

SECTION 8
ELECTRICAL PARTS LIST

Page

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SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers. For maximum reliability and performance, all other replacement parts should be identical to those specified.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS – All resistance values are in ohms (Ω).

K	1 000
M	1 000 000
CR	Carbon Resistor
Comp. R	Composition Resistor
WR	Wire Wound Resistor
OMR	Oxide Metal Film Resistor
VR	Variable Resistor (Potentiometer)
MFR	Metal Film Resistor
FR	Fusible Resistor

CAPACITORS – All capacitance values are in μF, unless otherwise indicated.

P	μμF
C Cap	Ceramic Capacitor
E Cap	Electrolytic Capacitor
FM Cap	Film Mica Capacitor
MM Cap	Metalized Mylar Capacitor
MP Cap	Metalized Paper Capacitor
MY Cap	Mylar Capacitor
NP Cap	Non-polar Capacitor
PC Cap	Polycarbonate Capacitor
PP Cap	Poly Pro Capacitor
PS Cap	Polystyrol Capacitor
T Cap	Tantalum Capacitor
TR Cap	Trimmer Capacitor

8.1 STANDARD PART NUMBER CODING

8.1.1 Chip Resistors (Metal Glaze Resistor)

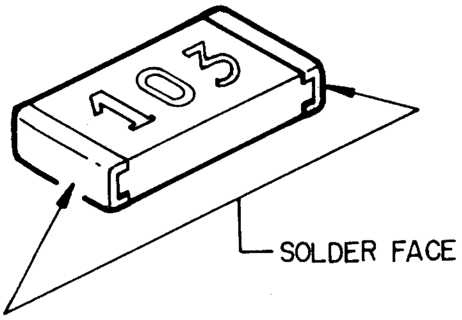

Fig. 8-1

- Resistance values are indicated in code on the side opposite to that facing the PC board. Since resistance values are not indicated in the parts list, use this coding table to identify them.
- Parts are supplied in packs of 5 units.
- Alternative method of replacement is to substitute chip resistors with ordinary carbon resistors type QRD167J.
- Rated wattage is 1/8 W.

8.1.2 Chip Capacitors (Ceramic Capacitor)

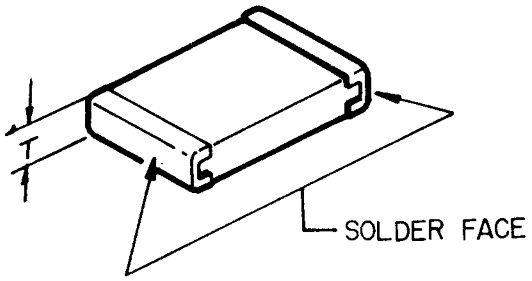

Fig. 8-2

- Capacitance values are not indicated on parts. Refer to schematic diagrams or parts list for capacitance.
- Parts are supplied in packs of 5 units.
- Rated voltage is 50 V.

T : Varies depending on capacitance values.

$$\underbrace{\text{QRS188}}_{\text{1/8 W Chip Resistor Code}}\ \underbrace{\boxed{\text{J}}}_{\text{Tolerance}}\text{-}\underbrace{\boxed{}\boxed{}\boxed{}}_{\text{Resistance Value}}$$

Symbol	Tolerance	
J	± 5 %	⇨ Standard
K	± 10 %	
M	± 20 %	

Examples:

R47	.....	0.47 Ω
4R7	.....	4.7 Ω
470	.....	47 Ω
471	.....	470 Ω
472	.....	4.7 kΩ
473	.....	47 kΩ
474	.....	470 kΩ
475	.....	4.7 MΩ

8.2 ELECTRICAL PARTS LIST BY ASSEMBLIES

8.2.1 PA Board Ass'y .... Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	NJM4558M	IC (M)	JRC
IC 2	″	″	″
IC 3	″	″	″
IC 4	″	″	″
IC 5	″	″	″
IC 6	″	″	″
IC 7	″	″	″
IC 8	″	″	″
IC 9	″	″	″
IC10	″	″	″
D 1	MA152A	Diode	MATSUSHITA
D 2	″	″	″
D 3	″	″	″
D 4	HZ6A1	Z. Diode	6 V HITACHI
Q 1	2SK198(Q)	FET	MATSUSHITA
Q 2	″	″	″
Q 3	2SC2295(B)	Transistor	″
Q 4	–	–	
Q 5	2SK198(Q)	FET	MATSUSHITA
Q 6	″	″	″
Q 7	–	–	
Q 8	2SA1022(B)	Transistor	MATSUSHITA
Q 9	2SK198(Q)	FET	″
Q10	2SC2295(B)	Transistor	″
Q11	2SJ84(Q)	FET	″
Q12	2SK198(Q)	″	″
Q13	2SC2295(B)	Transistor	″
Q14	″	″	″
Q15	″	″	″
Q16	″	″	″
Q101	2SC2480(S)	Transistor	MATSUSHITA
Q102	2SA970(BL)	″	″
Q103	2SC2295(B)	″	″
Q104	″	″	″
Q105	2SK198(Q)	FET	″
Q106	2SC2295(B)	Transistor	″
Q107	″	″	″
Q108	″	″	″
Q109	2SK198(Q)	FET	″
Q110	2SC2295(B)	Transistor	″
Q201	2SC2480(C)	Transistor	MATSUSHITA
Q202	2SA970(BL)	″	″
Q203	2SC2295(B)	″	″
Q204	″	″	″
Q205	2SK198(Q)	FET	″
Q206	2SC2295(B)	Transistor	″
Q207	″	″	″
Q208	″	″	″
Q209	2SK198(Q)	FET	″
Q210	2SC2295(B)	Transistor	″
Q301	2SC2480(S)	Transistor	MATSUSHITA
Q302	2SA970(BL)	″	″
Q303	2SC2295(B)	″	″
Q304	″	″	″
Q305	2SK198(Q)	FET	″
Q306	2SC2295(B)	Transistor	″
Q307	″	″	″
Q308	2SC2295(B)	Transistor	MATSUSHITA
Q309	2SK198(Q)	FET	″
Q310	2SC2295(B)	Transistor	″
R51	SCV0491-204	VR	200K IRES LEVEL
R72	″ -104	″	100K H FRAME BAL
R75	″ -104	″	100K V FRAME BAL
R81	″ -202	″	2K V FRAME CLIP
R84	″ -202	″	2K H FRAME CLIP
R106	″ -203	″	20K B HF
R112	″ -102	″	1K B IN GAIN
R118	″ -104	″	100K B-H SAW STATIC
R120	″ -104	″	100K B-H PARA STATIC
R122	″ -104	″	100K B-V SAW STATIC
R124	″ -104	″	100K B-V PARA STATIC
R130	″ -104	″	100K B BLK BAL
R150	″ -503	″	50K B-V FRAME
R152	″ -503	″	50K B-H FRAME
R206	″ -203	″	20K G HF
R212	″ -102	″	1K G IN GAIN
R218	″ -104	″	100K G-H SAW STATIC
R220	″ -104	″	100K G-H PARA STATIC
R222	″ -104	″	100K G-V SAW STATIC
R224	″ -104	″	100K G-V PARA STATIC
R226	″ -104	″	100K G-V SAW DY. SH.
R228	″ -104	″	100K G-V PARA DY. SH.
R230	″ -104	″	100K G BLK BAL
R250	″ -503	″	50K G-V FRAME
R252	″ -503	″	50K G-H FRAME
R306	″ -203	″	20K G HF
R312	″ -202	″	2K R IN GAIN
R318	″ -104	″	100K R-H SAW STATIC
R320	″ -104	″	100K R-H PARA STATIC
R322	″ -104	″	100K R-V SAW STATIC
R324	″ -104	″	100K R-V PARA STATIC
R326	″ -104	″	100K R-V SAW DY. SH.
R328	″ -104	″	100 R-V PARA DY. SH.
R330	″ -104	″	100K R BLK BAL

Symbol No.	Part No.	Part Name	Description
R350	SCV0491-503	VR	50K R-V FRAME
R352	" -503	"	50K R-H FRAME
C 1	QCS81HJ-220	C Cap	22 P 50 V J
C 2	QFM81HM-472	MY Cap	0.0047 "
C 3	" -102	"	0.001 "
C 4	QEJ41VM-474	T Cap	0.47 35 V
C 5	QEE41VM-474	"	0.47 "
C 6	" -474	"	0.47 "
C 7	QEJ41VM-474	"	0.47 "
C 8	QEPC0JM-476	NP Cap	47 6.3 V
C 9	" -476	"	47 "
C10	QEJ41AM-106	T Cap	10 10 V
C11	QER41EM-106	E Cap	10 25 V
C12	QER40JM-476	"	47 6.3 V
C13	QER41EM-106	"	10 25 V
C14	QEJ41AM-475	T Cap	4.7 10 V
C15	" -475	"	4.7 "
C16	QCF81HZ-104	C Cap	0.1 50 V
C17	QEPC1CM-475	NP Cap	4.7 16 V
C18	QEPC0JM-476	"	47 10 V
C19	" -476	"	47 "
C20	QEJ41AM-106	T Cap	10 "
C21	QETC1AM-227	E Cap	220 "
C22	QEE41AM-226	T Cap	22 "
C23	QER40JM-476	E Cap	47 6.3 V
C24	QER41AM-476	"	47 10 V
C25	QEPC1HM-105	BP Cap	1 50 V
C26	" -106	"	10 "
C27	QER40JM-476	E Cap	47 6.3 V
C28	" -476	"	47 "
C29	QFC81HZ-104	C Cap	0.1 50 V
C30	QEPC0JM-476	NP Cap	47 10 V
C31	QFC81HZ-104	C Cap	0.1 50 V
C32	" -104	"	0.1 "
C33	" -104	"	0.1 "
C34	" -104	"	0.1 "
C101	QAT3001-054	TR Cap	18 P
C102	QCS81HJ-5R0	C Cap	5 P 50 V J
C103	QEJ41AM-106	T Cap	10 10 V
C104	QEE41AM-106	"	10 "
C105	QEJ41VM-105	"	1 35 V
C106	QCS81HJ-220	C Cap	22 P 50 V J
C107	" -120	"	12 P " "
C108	QEJ41AM-226	T Cap	22 10 V
C109	QEPA0JM-476	NP Cap	47
C110	QCF81HZ-104	C Cap	0.1 50 V
C111	QCS81HJ-220	"	22 P " J
C112	QER41EM-106	E Cap	10 25 V
C113	QEJ41AM-106	T Cap	10 10 V
C114	QER41AM-476	E Cap	47 "
C115	QEPC0JM-476	NP Cap	47 "
C116	QCS81HJ-101	C Cap	100 P 50 V J
C117	" -101	"	100 P " "
C118	" -120	"	12 P " "
C201	QAT3001-054	TR Cap	18 P
C202	QCS81HJ-5R0	C Cap	5 P 50 V J
C203	QEJ41AM-106	T Cap	10 10 V
C204	QEJ41AM-106	"	10 "

Symbol No.	Part No.	Part Name	Description
C205	QEJ41VM-105	T Cap	1 35 V
C206	QCS81HJ-220	C Cap	22 P 50 V J
C207	" -7R0	"	7 P " "
C208	QEJ41AM-226	T Cap	22 10 V
C209	QEPC0JM-476	NP Cap	47 "
C210	QCF81HZ-104	C Cap	0.1 50 V
C211	QCS81HJ-220	"	22 P "
C212	QER41EM-106	E Cap	10 25 V
C213	QEJ41AM-106	T Cap	10 10 V
C214	QER41AM-476	E Cap	47 "
C215	QEPC0JM-476	NP Cap	47 "
C216	QCS81HJ-101	C Cap	100 P 50 V J
C217	" -101	"	100 P " "
C218	" -120	"	12 P " "
C301	QAT3001-054	TR Cap	18 P
C302	QCS81HJ-5R0	C Cap	5 P 50 V
C303	QEE41AM-106	T Cap	10 10 V
C304	QEJ41AM-106	"	10 "
C305	QET41VM-105	"	1 35 V
C306	QCS81HJ-220	C Cap	22 P 50 V J
C307	" -120	"	12 P " "
C308	QEJ41AM-226	T Cap	22 10 V
C309	" -476	"	47 "
C310	QCF81HZ-104	C Cap	0.1 50 V
C311	QCS81HJ-220	"	22 P " J
C312	QER41EM-106	E Cap	10 25 V
C313	QEJ41AM-106	T Cap	10 10 V
C314	QER41AM-476	E Cap	47 "
C315	QEPC0JM-476	NP Cap	47 6.3 V
C316	QCS81HJ-101	C Cap	100 P 50 V J
C317	" -101	"	100 P " "
C318	" -120	"	12 P " "
L 1	SA40318-001	Coil	
L101	SCV0331-180	Peaking Coil	18 μH
L102	" -101	"	100 μH
L201	SCV0331-180	Peaking Coil	18 μH
L202	" -101	"	100 μH
L301	SCV0331-180	Peaking Coil	18 μH
L302	" -101	"	100 μH
CN 6	SCV0441-006	Connector	
CN 8	SCV0441-007	"	
CN27	SCV0441-011	"	
CN31	SCV0441-004	"	
CN32	" -004	"	
CN33	" -004	"	
	SC41587-001	Shield Plate	
	" -002	"	

8.2.2 PR Board Ass'y .... Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	NJM4558M	IC (M)	JRC
IC 2	"	"	"
IC101	SCV0562-001	Function Module (H)	JVC
IC102	NJM1496M	IC (M)	JRC
IC103	SCV0563-001	Function Module (H)	JVC
IC104	SCV0577-001	"	"
IC201	SCV0562-001	Function Module (H)	JVC
IC202	NJM1496M	IC (M)	JRC
IC203	SCV0563-001	Function Module (H)	JVC
IC204	SCV0577-001	"	"
IC301	SCV0562-001	Function Module (H)	JVC
IC302	NJM1496M	IC (M)	JRC
IC303	SCV0563-001	Function Module (H)	JVC
IC304	SCV0577-001	"	"
Q 1	2SC2295(B)	Transistor	MATSUSHITA
Q 2	2SA1022(B)	"	"
Q 3	2SC2295(B)	"	"
Q 4	"	"	"
Q 5	"	"	"
Q 6	DTC124K	"	ROHM
Q 7	2SC2295(B)	"	MATSUSHITA
Q 8	"	"	"
Q 9	"	"	"
Q10	"	"	"
Q11	"	"	"
Q12	"	"	"
Q13	"	"	"
Q14	"	"	"
Q15	"	"	"
Q16	DTC124K	"	ROHM
Q17	"	"	"
Q18	"	"	"
Q19	"	"	"
Q20	2SC2295(B)	"	MATSUSHITA
Q101	–	–	
Q102	2SA1022(B)	Transistor	MATSUSHITA
Q103	2SK198(Q)	FET	"
Q104	2SC2295(B)	Transistor	"
Q105	"	"	"
Q106	2SA1022(B)	"	"
Q107	2SC2295(B)	"	"
Q108	"	"	"
Q109	"	"	"
Q110	2SA1022(B)	"	"
Q111	"	"	"
Q112	2SC2295(B)	"	"
Q113	"	"	"
Q201	–	–	
Q202	2SA1022(B)	Transistor	MATSUSHITA
Q203	2SK198(Q)	FET	"
Q204	2SC2295(B)	Transistor	"
Q205	"	"	"
Q206	2SA1022(B)	"	"

Symbol No.	Part No.	Part Name	Description
Q207	2SC2295(B)	Transistor	MATSUSHITA
Q208	"	"	"
Q209	"	"	"
Q210	2SA1022(B)	"	"
Q211	"	"	"
Q212	2SC2295(B)	"	"
Q213	"	"	"
Q301	–	–	
Q302	2SA1022(B)	Transistor	MATSUSHITA
Q303	2SK198(Q)	FET	"
Q304	2SC2295(B)	Transistor	"
Q305	"	"	"
Q306	2SA1022(B)	"	"
Q307	2SC2295(B)	"	"
Q308	"	"	"
Q309	"	"	"
Q310	2SA1022(B)	"	"
Q311	"	"	"
Q312	2SC2295(B)	"	"
Q313	"	"	"
D 1	MA152A	Diode	MATSUSHITA
D101	1S2076A	Si Diode	
D102	"	"	
D103	"	"	
D104	"	"	
D201	1S2076A	Si Diode	
D202	"	"	
D203	"	"	
D204	"	"	
D301	1S2076A	Si Diode	
D302	"	"	
D303	"	"	
D304	"	"	
R26	SCV0601-502	VR	5K R BLK
R31	SCV0601-502	VR	5K B BLK
R38	SCV0600-502	VR	5K R FLARE
R58	SCV0600-102	VR	1K R-B MTX
R62	SCV0600-102	VR	1K B-R MTX
R65	SCV0600-102	VR	1K G-R MTX

Symbol No.	Part No.	Part Name	Description		
R69	SCV0600-102	VR	1K R-G MTX		
R72	SCV0600-102	VR	1K B-G MTX		
R76	SCV0600-102	VR	1K G-B MTX		
R116	SCV0601-103	VR	10K B KNEE		
R128	SCV0601-202	VR	2K B GAMMA		
R131	SCV0601-202	VR	2K B GAIN		
R138	SCV0601-502	VR	5K B W CLIP		
R216	SCV0601-103	VR	10K G KNEE		
R228	SCV0601-202	VR	2K G GAMMA		
R231	SCV0601-202	VR	2K G GAIN		
R238	SCV0601-502	VR	5K G W CLIP		
R316	SCV0601-103	VR	10K R KNEE		
R328	SCV0601-202	VR	2K R GAMMA		
R331	SCV0601-202	VR	2K R GAIN		
R338	SCV0601-502	VR	5K R W CLIP		
C 1	–	–			
C 2	–	–			
C 3	–	–			
C 4	QER41AM-106	E Cap	10	10 V	
C 5	–	–			
C 6	QEE41AM-226	T Cap	22	10 V	
C 7	QCF81HZ-104	C Cap	0.1	50 V	
C 8	″ -104	″	0.1	″	
C 9	–	–			
C10	QCF81HZ-104	C Cap	0.1	50 V	
C11	QCT81CH-150	″	15 P	″	
C12	″ -330	″	33 P	″	
C13	QER41AM-476	E Cap	47	10 V	
C14	QEJ41AM-226	T Cap	22	″	
C15	QER41AM-476	E Cap	47	″	
C16	QEE41AM-226	T Cap	22	″	
C17	QETC1AM-227	E Cap	220	″	
C20	QCS81HJ-470	C Cap	47 P	50 V	
C101	–	–			
C102	–	–			
C103	QER41EM-106	E Cap	10	25 V	
C104	QFV81HJ-473	NP Cap	0.047	50 V	
C105	QEJ41VM-105	T Cap	1	35 V	

Symbol No.	Part No.	Part Name	Description		
C106	QEJ41VM-106	T Cap	10	35 V	
C107	QCS81HJ-390	C Cap	39 P	50 V	J
C108	QEE41AM-226	T Cap	22	10 V	
C109	QER41EM-106	E Cap	10	25 V	
C110	–	–			
C111	QEJ41VM-684	T Cap	0.68	35 V	
C112	QER41EM-106	E Cap	10	25 V	
C113	QCS81HJ-150	C Cap	15 P	50 V	J
C114	″ -680	″	68 P	″	″
C201	QEJ41VM-105	T Cap	1	35 V	
C202	–	–			
C203	QER41EM-106	E Cap	10	25 V	
C204	QFV81HJ-473	NP Cap	0.047	50 V	
C205	QEJ41VM-105	T Cap	1	35 V	
C206	″ -106	″	10	″	
C207	QCS81HJ-390	C Cap	39 P	50 V	J
C208	–	–			
C209	QER41EM-106	E Cap	10	25 V	
C210	–	–			
C211	QEPC1HM-105	NP Cap	1	50 V	
C212	QER41EM-106	E Cap	10	25 V	
C213	QCS81HJ-150	C Cap	15 P	50 V	J
C214	″ -680	″	68 P	″	″
C301	–	–			
C302	–	–			
C303	QER41EM-106	E Cap	10	25 V	
C304	QFV81HJ-473	NP Cap	0.047	50 V	
C305	QEJ41VM-105	T Cap	1	35 V	
C306	″ -106	″	10	″	
C307	QCS81HJ-390	C Cap	39 P	50 V	J
C308	QEJ41AM-226	T Cap	22	10 V	
C309	QER41EM-106	E Cap	10	25 V	
C310	–	–			
C311	QEJ41VM-684	T Cap	0.68	35 V	J
C312	QER41EM-106	E Cap	10	25 V	
C313	QCS81HJ-150	C Cap	15 P	50 V	J
C314	″ -680	″	68 P	″	″
L 1	SCV0331-101	Peaking Coil	100 μH		
L101	SCV0331-220	Peaking Coil	22 μH		
L201	SCV0331-220	Peaking Coil	22 μH		
L301	SCV0331-220	Peaking Coil	22 μH		
S 1	SCV0403-001	Slide Switch	MATRIX		
	SCV0501-001	30-P Connector			

8.2.3 CC Board Ass'y . . . . Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	NJM1496M	IC (M)	JRC
IC 2	MC1733CP	''	MOTOROLA
IC 3	TL062CP	''	TEXAS
IC 4	MC1733CP	''	MOTOROLA
IC 5	SCV0472-001	Function Module (H)	JVC
IC 6	MC1733CP	IC (M)	MOTOROLA
Q 1	2SC2406(B)	Transistor	MATSUSHITA
Q 2	2SK198(Q)	FET	''
Q 3	2SA1022(B)	Transistor	''
Q 4	2SC2295(B)	''	''
Q 5	2SC2480(S)	''	''
Q 6	''	''	''
Q 7	''	''	''
Q 8	''	''	''
Q 9	''	''	''
Q10	2SA1022(B)	''	''
Q11	2SK198(Q)	FET	''
Q12	2SA1022(B)	Transistor	''
Q13	''	''	''
Q14	2SC2295(B)	''	''
Q15	''	''	''
Q16	''	''	''
Q17	2SA1022(B)	''	''
Q18	2SK198(Q)	FET	''
Q19	''	''	''
Q20	–	–	
Q21	–	–	
Q22	–	–	
Q23	–	–	
Q24	2SK198(Q)	FET	MATSUSHITA
Q25	''	''	''
Q26	''	''	''
Q27	''	''	''
Q28	2SA1022(B)	Transistor	''
Q29	2SC2480(S)	''	''
Q30	''	''	''
Q31	''	''	''
Q32	''	''	''
Q33	2SA1022(B)	''	''
Q34	2SK198(Q)	FET	''
Q35	2SA1022(B)	Transistor	''
Q36	''	''	''
Q37	2SC2295(B)	''	''
Q38	''	''	''
Q39	''	''	''
Q40	2SA1022(B)	''	''
Q41	2SC2295(B)	''	''
Q42	''	''	''
Q43	2SA1022(B)	''	''
Q44	2SC2295(B)	''	''
Q45	2SK198(Q)	FET	''
Q46	2SA1022(B)	Transistor	''
Q47	2SK198(Q)	FET	''
Q48	2SA1022(B)	Transistor	''
Q49	''	''	''
Q50	2SK198(Q)	FET	''
Q51	2SC2295(B)	Transistor	''
Q52	''	''	''
Q53	2SA1022(B)	''	''
Q54	''	''	''

Symbol No.	Part No.	Part Name	Description
D 1	1SS99	Si Diode	
D 2	''	''	
DL 1	SCV0368-001	Delay Line	(NTSC)
	SCV0369-001	''	(PAL)
DL 2	SCV0573-001	''	
DL 3	SCV0572-001	''	
R112	SCV0600-502	VR	5K V. BAL
R119	SCV0601-202	VR	2K V. LEVEL
R132	SCV0601-202	VR	2K H. LEVEL
R151	SCV0600-502	VR	5K LEVEL DEPEND
R162	SCV0600-202	VR	2K NOISE SLICE
C 1	QER41EM-106	E Cap	10 25 V
C 2	QEPC1HM-105	NP Cap	1 50 V
C 3	QER40JM-476	E Cap	47 6.3 V
C 4	QER41AM-476	''	47 10 V
C 5	QCS81HJ-560	C Cap	56 P 50 V J
C 6	QEJ41AM-106	T Cap	10 10 V
C 7	QCF81HZ-104	C Cap	0.1 50 V
C 8	QCS81HJ-330	''	33 P '' J
C 9	'' -271	''	270 P '' ''
C10	QCF81HZ-104	''	0.1 ''
C11	QCY81HK-103	''	0.01 ''
C12	QCS81HJ-151	''	150 P '' J
C13	QEJ41AM-106	T Cap	10 10 V
C14	QCF81HZ-104	C Cap	0.1 50 V
C15	'' -104	''	0.1 ''
C16	'' -104	''	0.1 ''
C17	QER40JM-476	E Cap	47 6.3 V
C18	'' -476	''	47 ''
C19	QCS81HJ-100	C Cap	10 P 50 V J
C20	'' -100	''	10 P '' ''
C21	QCF81HZ-104	''	0.1 ''
C22	QER41EM-106	E Cap	10 25 V
C23	QER41AM-476	''	47 10 V
C24	QEJ41VM-684	T Cap	0.68 35 V
C25	QEE41VM-684	''	0.68 ''
C26	QEJ41VM-684	''	0.68 ''
C27	QER40JM-476	E Cap	47 6.3 V
C28	QEJ41CM-225	T Cap	2.2 16 V
C29	QEPC1CM-475	NP Cap	4.7 16 V
C30	QCF81HZ-104	C Cap	0.1 50 V
C31	'' -104	''	0.1 ''

Symbol No.	Part No.	Part Name	Description
C32	QCS81HJ-100	C Cap	10 P 50 V
C33	QCF81HZ-104	"	0.1 "
C34	—	—	
C35	QEPC1CM-475	NP Cap	4.5 16 V
C36	QCY81HK-473	C Cap	0.0047 50 V
C37	QEJ41AM-106	T Cap	10 10 V
C38	QCF81HZ-104	C Cap	0.1 50 V
C39	" -104	"	0.1 "
C40	" -104	"	0.1 "
C41	QER40JM-476	E Cap	47 6.3 V
C42	" -476	"	47 "
C43	QCS81HJ-100	C Cap	10 P 50 V
C44	" -100	"	10 P "
C45	QCF81HZ-104	"	0.1 "
C46	QCS81HJ-101	"	100 P " J
C47	" -220	"	22 P " "
C48	QER41AM-476	E Cap	47 10 V
C49	QEJ41AM-226	T Cap	22 "
C50	" -476	"	47 "
C51	QEPA1HM-105	BP Cap	1 50 V
C52	QCS81HJ-2R0	C Cap	2 P " J
C53	" -2R0	"	2 P " "
C54	QER41EM-106	E Cap	1 25 V
C55	QCF81HZ-104	C Cap	0.1 50 V
C56	QER40JM-476	E Cap	47 6.3 V
C57	QER41EM-106	"	10 25 V
C58	QER41EM-106	"	1 25 V
C59	QER40JM-107	"	10 6.3 V
C60	QEJ41VM-684	T Cap	0.68 35 V
C61	QCS81HJ-390	C Cap	39 P 50 V J
C62	QCY81HK-103	"	0.001 "
C63	QER40JM-476	E Cap	47 6.3 V
C64	" -476	"	47 "
C65	QER41AM-476	"	47 10 V
C66	QEJ41AM-226	T Cap	22 "
C67	QCF81HZ-104	C Cap	0.1 50 V
C68	QER41AM-476	E Cap	47 10 V
L 1	SCV0331-2R2	Peaking Coil	2.2 µH
L 2	" -2R2	"	2.2 µH
L 3	" -101	"	100 µH
L 4	—	—	
L 5	—	—	
L 6	SCV0331-390	Peaking Coil	39 µH
L 7	" -220	"	22 µH
L 8	" -101	"	100 µH
L 9	—	—	
L10	—	—	
L11	SCV0331-390	Peaking Coil	39 µH
L12	" -121	"	120 µH
L13	SA40318-00A	Choke Coil	
S 1	SCV0403-001	Slide Switch	CONTOUR SW.
	SCV0188-001	OSC	
	SCV0501-001	30-P Connector	

8.2.4 DF Board Ass'y . . . . Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	SCV0479-001	Function Module (H)	JVC
IC 2	" -001	"	"
IC 3	" -001	"	"
IC 4	AN614	IC (M)	MATSUSHITA
IC 5	"	"	"
IC 6	"	"	"
IC 7	NJM4558M	"	JRC
IC 8	"	"	"
IC 9	NJM3414M	"	"
IC10	NJM4558M	"	"
IC11	"	"	"
Q 1	2SK198(Q)	FET	MATSUSHITA
Q 2	2SC2295(B)	Transistor	"
Q 3	2SA1022(B)	"	"
Q 4	2SD602(Q)	"	"
Q 5	2SC1384(R)	"	"
Q 6	2SA684(R)	"	"
Q 7	2SC1384(R)	"	"
Q 8	2SA1022(B)	"	"
Q 9	"	"	"
Q10	2SC1621(B)	"	"
Q11	2SD763	"	"
Q12	2SK198(Q)	FET	"
Q13	2SB710(Q)	Transistor	"
Q14	2SD602(Q)	"	"
Q15	"	"	"
Q16	2SB710(Q)	"	"
Q17	—	—	
Q18	2SK198(Q)	FET	MATSUSHITA
Q19	DTC124K	Transistor	ROHM
Q20	2SC2295(B)	"	MATSUSHITA
Q21	"	"	"
Q22	2SD602(Q)	"	"
Q23	2SB710(Q)	"	"
Q24	"	"	"
Q25	2SD602(Q)	"	"
Q26	2SK198(Q)	FET	"
D 1	MA152A	Si Diode	MATSUSHITA
D 2	"	"	"
D 3	"	"	"
D 4	1S2076A	"	
D 5	MA152A	"	MATSUSHITA

Symbol No.	Part No.	Part Name	Description
R 1	SCV0600-503	VR	50K R-H PIN
R 3	SCV0600-503	VR	50K B-H PIN
R 5	SCV0600-104	VR	100K B-H BOW
R 7	SCV0600-104	VR	100K R-H BOW
R20	SCV0600-503	VR	50K M-V LIN
R22	SCV0600-104	VR	100K B-V LIN
R24	SCV0600-104	VR	100K R-V LIN
R26	SCV0600-503	VR	50K M-H PIN
R29	SCV0600-502	VR	50K M-V AMP
R36	GC31875-103C	VR	10K B-H SHIFT
R38	SCV0600-103	VR	10 K B-V AMP
R40	GC31875-103C	VR	10K B-V SHIFT
R43	" -103C	VR	10K G-H SHIFT
R46	" -103C	VR	10K G-V SHIFT
R48	" -103C	VR	10K R-H SHIFT
R50	SCV0600-103	VR	10 K R-V AMP
R52	GC31875-103C	VR	10K R-V SHIFT
R61	SCV0600-503	VR	50K B SKEW
R62	" -503	"	50K G SKEW
R63	" -503	"	50K R SKEW
R70	SCV0600-102	VR	1K M-H LIN
R81	SCV0600-502	VR	5K M-H AMP
R94	GC31875-100C	VR	10 B-H LIN
R99	GC31875-100C	VR	10 G-H AMP
R104	GC31875-100C	VR	10 R-H LIN
R112	SCV0600-103	VR	1K M-V PIN
R119	SCV0600-103	VR	1K B-V TRAP
R120	" -103	"	1K B-V PIN
R129	SCV0600-103	VR	1K R-V TRAP
R130	" -103	"	1K R-V PIN
R144	SCV0600-104	VR	100K R-V BOW
R146	SCV0600-104	VR	100K B-V BOW
R151	SCV0600-104	VR	100K R-H TRAP
R152	" -104	"	100K B-H TRAP

Symbol No.	Part No.	Part Name	Description
C 1	QCS81HJ-220	C Cap	22 P 50 V J
C 2	QFM41HM-472	MY Cap	0.0047 "
C 3	QEJ41AM-226	T Cap	22 10 V
C 4	QFV81HJ-154	MY Cap	0.15 50 V
C 5	QER41EM-106	E Cap	10 25 V
C 6	QFV81HJ-473	MY Cap	0.047 50 V
C 7	QER41HM-475	E Cap	4.7 "
C 8	QEJ40JM-476	T Cap	47 6.3 V
C 9	QER40JM-476	E Cap	47 "
C10	QEPC1CM-106	NP Cap	10 16 V
C11	QEE41AM-226	T Cap	22 10 V
C12	QER41HM-105	E Cap	1 50 V
C13	QER40JM-107	"	100 6.3 V
C14	QEJ40JM-476	T Cap	47 "
C15	QEJ41AM-226	"	22 10 V
C16	QETC1AM-227	E Cap	220 "
C17	QEPC1CM-475	NP Cap	4.7 16 V
C18	QCF81HZ-104	C Cap	0.1 50 V
C19	QER40JM-107	E Cap	100 6.3 V
C20	QER41AM-476	"	47 10 V
C21	QEPC1CM-475	NP Cap	4.7 16 V
C22	QER41AM-476	E Cap	47 10 V
C23	QEPC1CM-475	NP Cap	4.7 16 V
C24	QCF81HZ-104	C Cap	0.1 50 V
C25	QER41HM-105	E Cap	1 "
C26	QER40JM-476	"	47 6.3 V
C27	QETC1AM-227	"	220 10 V
C28	QEJ40JM-476	T Cap	47 6.3 V
C29	QER40JM-476	E Cap	47 "
C30	QCS81HJ-101	C Cap	100 P 50 V J
C31	QCY81HK-682	"	0.0068 " K
C32	QER41EM-106	E Cap	10 25 V
C33	QEPC1CM-106	NP Cap	10 16 V
C34	QER41EM-106	E Cap	10 25 V
C35	QEE41AM-336	"	33 10 V
C36	QEJ41AM-336	T Cap	33 "
C37	QER41AM-476	E Cap	47 "
C38	QCY81HK-393	C Cap	0.039 50 V K
C39	QER41EM-106	E Cap	10 25 V
C40	QETC1AM-227	"	220 10 V
C41	QFM41HM-183	MY Cap	0.018 50 V
C42	QEJ40JM-476	T Cap	47 6.3 V
C43	QEJ41AM-336	"	33 10 V
C44	QEJ40JM-476	"	47 6.3 V
C45	QCS81HJ-270	C Cap	27 P 50 V J
C46	QEJ41AM-226	T Cap	22 10 V
C47	" -226	"	22 "
C48	" -226	"	22 "
C49	QER40JM-476	E Cap	47 6.3 V
C50	" -107	"	100 "
C51	QER41HM-475	"	4.7 50 V
C52	" -475	"	4.7 "
C53	QETA1AM-227	"	220 10 V
C54	QETC1AM-227	"	220 "
C55	QER40JM-476	"	47 6.3 V
C56	QER41HM-475	"	4.7 50 V
C57	" -475	"	4.7 "
C58	QCF81HZ-104	C Cap	0.1 "
C59	QER41HM-475	E Cap	4.7 "
C60	" -475	"	4.7 "
C61	QCF81HZ-104	C Cap	0.1 "
C62	QEPC1CM-106	E Cap	10 16 V
C63	QER40JM-476	"	47 6.3 V
C64	QEE40JM-476	T Cap	47 "
C65	QEPC1CM-106	E Cap	10 16 V

Symbol No.	Part No.	Part Name	Description
C66	QETC1AM-227	E Cap	220 10 V
C67	QEJ40JM-476	T Cap	47 "
C68	QCF81HZ-104	C Cap	0.1 50 V
C69	" -104	"	0.1 "
C70	" -104	"	0.1 "
L 1	GP42267-561	Choke Coil	560 μH
L 2	SCV0170-001	Coil	
L 3	SCV0395-153	Choke Coil	1.5 mH
L 4	SCV0170-001	Coil	
L 5	SCV0395-153	Choke Coil	1.5 mH
L 6	SCV0170-001	Coil	
L 7	SCV0395-153	Choke Coil	1.5 mH
S 1	SCV0403-001	Slide Switch	NTSC—PAL
S 2	SCV0490-001	"	OVER SCAN
T 1	SCV0248-001	LIN. Trans.	
CN34	SCV0440-009	Connector	9-pin
CN35	" -005	"	5-pin
CN36	" -005	"	"
CN37	" -005	"	"

8.2.5 SE Board Ass'y (NTSC) . . . . Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	SCV0322-002	Function Module (H)	JVC
IC 2	SCV0486-001	"	"
IC 3	SCV0498-001	"	"
IC 4	SCV0482-001	"	"
IC 5	SCV0483-001	"	"
IC 6	SCV0355-001	"	"
IC 7	AN614	IC (M)	MATSUSHITA
IC 8	"	"	"
IC 9	TC50H000P	"	TOSHIBA
IC10	TC4053BF	"	"
IC11	TC40H004F	"	"
IC12	TC40H000F	"	"
IC13	TC40H004F	"	"
IC14	TC40H008F	"	"
IC15	TC4053BF	"	"
IC16	NJM4560M	"	JRC
IC17	TC40H193F	"	TOSHIBA
Q 1	2SC2295(B)	Transistor	MATSUSHITA
Q 2	"	"	"
Q 3	"	"	"
Q 4	"	"	"
Q 5	"	"	"
Q 6	"	"	"
Q 7	2SA777(R)	"	"
Q 8	2SC2295(B)	"	"
Q 9	"	"	"
Q10	"	"	"
Q11	2SA1022(B)	"	"
Q12	2SC2295(B)	"	"
Q13	2SA1022(B)	"	"
Q14	2SC2295(B)	"	"
Q15	2SA1022(B)	"	"
Q16	2SC2295(B)	"	"
Q17	2SA1022(B)	"	"
Q18	2SK198(Q)	FET	"
Q19	2SC2295(B)	Transistor	"
Q20	"	"	"
Q21	2SA1022(B)	"	"
Q22	"	"	"
Q23	"	"	"
Q24	2SC2295(B)	"	"
Q25	2SK198(Q)	FET	"
Q26	2SC2295(B)	Transistor	"
Q27	"	"	"
Q28	2SA1022(B)	"	"
Q29	2SC2295(B)	"	"
Q30	"	"	"
Q31	2SK198(Q)	FET	"
Q32	2SC2295(B)	Transistor	"
Q33	"	"	"
Q34	2SA1022(B)	"	"
Q35	2SC2295(B)	"	"
Q36	"	"	"
Q37	2SK198(Q)	FET	"
Q38	2SC2295(B)	Transistor	"
Q39	2SA1022(B)	"	"
Q40	2SC2295(B)	"	"
Q41	2SA1022(B)	"	"

Symbol No.	Part No.	Part Name	Description
D 1	MA152A	Si Diode	MATSUSHITA
D 2	"	"	"
D 3	"	"	"
D 4	1S2688G	Vari. Cap Diode	
D 5	MA152A	Si Diode	MATSUSHITA
D 6	"	"	"
D 7	"	"	"
D 8	1S2688G	Vari. Cap Diode	
D 9	MA152A	Si Diode	MATSUSHITA
D10	"	"	"
R28	SCV0380-303	VR	30K H PHASE
R60	SCV0600-202	VR	2K INT. SC FINE
R65	SCV0380-202	VR	2K EXT. SC FINE
R73	SCV0600-501	VR	500 SC LOCK
R88	SCV0600-202	VR	2K Y GAIN
R97	SCV0601-502	VR	5K SYNC LEVEL
R116	SCV0600-201	VR	200 QUAD.
R142	SCV0601-501	VR	500 CHROMA GAIN
R147	SCV0600-103	VR	10K BURST STOP
R148	" -103	"	10K BURST START
R150	SCV0600-502	VR	5K BURST LEVEL
R156	SCV0600-102	VR	1K Q GAIN
R160	SCV0600-103	VR	10K BURST PHASE
R168	SCV0601-102	VR	1K Q CAL BAL
R169	" -102	"	1K I CAL BAL
C 1	QEE41AM-106	T Cap	10 10 V
C 2	QCY81HK-103	C Cap	0.01 50 V K
C 3	QAT3001-011	TR Cap	18 P
C 4	QCT05CH-150	C Cap	15 P 50 V
C 5	QETC1AM-227	E Cap	220 10 V
C 6	QCY81HK-103	C Cap	0.01 50 V K
C 7	QCT81CH-151	"	150 P "
C 8	QCY81HK-103	"	0.01 50 V K
C 9	QEE41AM-106	T Cap	10 10 V
C10	QCF81HZ-104	C Cap	0.1 50 V

Symbol No.	Part No.	Part Name	Description
C11	QCF81HZ-104	C Cap	0.1 50 V
C12	QCY81HK-103	"	0.01 " K
C13	QAT3001-011	TR Cap	18 P
C14	QCT05CH-8R0	C Cap	8 P 50 V
C15	QCY81HK-103	"	0.01 " K
C16	QCT81CH-101	"	100 P "
C17	" -101	"	100 P "
C18	QCY81HK-333	C Cap	0.033 " K
C19	QEJ41AM-475	T Cap	4.7 10 V
C20	" -106	"	10 "
C21	" -475	"	4.7 "
C22	" -106	"	10 "
C23	QEE41AM-475	"	4.7 "
C24	QCY81HK-333	C Cap	0.033 50 V K
C25	" -103	"	0.001 " "
C26	QCT81CH-220	"	22 P "
C27	QCY81HK-103	"	0.01 " K
C28	QCT81CH-101	"	100 P "
C29	QCY81HK-103	"	0.01 "
C30	QCT81CH-101	"	100 P "
C31	QCY81HK-103	"	0.01 "
C32	QCT81CH-560	"	56 P "
C33	QCY81HK-103	"	0.01 "
C34	QCT81CH-680	"	56 P "
C35	QCY81HK-103	"	0.01 "
C36	" -103	"	0.01 "
C37	" -103	"	0.01 "
C38	QEJ41VM-105	T Cap	1 35 V
C39	QEJ41AM-106	"	10 10 V
C40	QCF81HZ-104	C Cap	0.1 50 V
C41	QCS81HJ-6R0	"	6 P " J
C42	" -150	"	15 P " "
C43	" -3R0	"	3 P " "
C44	" -120	"	12 P " "
C45	" -8R0	"	8 P " "
C46	" -5R0	"	5 P " "
C47	QCF81HZ-104	"	0.1 "
C48	QER41EM-106	E Cap	10 25 V
C49	QCS81HJ-120	C Cap	12 P 50 V J
C50	QCS81HJ-7R0	"	7 P " "
C51	" -7R0	"	7 P " "
C52	" -7R0	"	7 P " "
C53	QER40JM-476	E Cap	47 6.3 V
C54	QCT81CH-151	C Cap	150 P 50 V
C55	QCS81HJ-390	"	39 P " J
C56	QER41EM-106	E Cap	10 25 V
C57	QCY81HK-103	C Cap	0.01 50 V K
C58	" -103	"	0.01 " "
C59	" -103	"	0.01 " "
C60	QCF81HZ-104	"	0.1 "
C61	QCT81CH-101	"	100 P "
C62	" -510	"	51 P "
C63	" -151	"	150 P "
C64	" -101	"	100 P "
C65	QETC1AM-227	E Cap	220 10 V
C66	QCT81CH-101	C Cap	100 P 50 V
C67	QCF81HJ-104	"	0.1 " J
C68	QEJ41VM-105	T Cap	1 35 V
C69	QCY81HK-103	C Cap	0.01 50 V K
C70	" -103	"	0.01 " "
C71	" -103	"	0.01 " "
C72	QER40JM-476	E Cap	47 6.3 V
C73	—	—	
C74	QEJ41VM-105	T Cap	1 35 V
C75	QCY81HK-103	C Cap	0.01 50 V K

Symbol No.	Part No.	Part Name	Description
C76	QER41AM-476	E Cap	47 10 V
C77	QCS81HJ-470	C Cap	47 P 50 V J
C78	QEJ41AM-106	T Cap	10 10 V
C79	QER40JM-107	E Cap	100 "
C80	QCY81HK-103	C Cap	0.01 50 V K
C81	" -103	"	0.01 " "
C82	" -103	"	0.01 " "
C83	QCF81HZ-104	"	0.1 "
C84	QCY81HK-103	"	0.01 " K
C85	QEE41AM-106	T Cap	10 10 V
C86	QCF81HZ-104	C Cap	0.1 50 V
C87	–	–	
C88	QEE41AM-106	T Cap	10 10 V
C89	" -106	"	10 "
C90	QCS81HJ-220	C Cap	22 P 50 V J
C91	QCS81HZ-101	"	100 P "
C92	" -101	"	100 P "
C93	QCT81CH-100	"	10 P "
L 1	SCV0331-820	Peaking Coil	82 μH
L 2	" -220	"	22 μH
L 3	" -120	"	12 μH
L 4	–	–	
L 5	SCV0331-470	Peaking Coil	47 μH
L 6	" -470	"	47 μH
L 7	" -121	"	120 μH
L 8	" -220	"	22 μH
L 9	" -470	"	47 μH
L10	" -100	"	10 μH
L11	" -220	"	22 μH
L12	SA40318-00A	Choke Coil	
DL 1	SCV0565-001	Delay Line	
DL 2	SCV0566-001	"	
X 1	SCV0347-002	Crystal	
X 2	" -002	"	
T 1	GC44286-001	Trans.	
S 1	SCV0389-001	Slide Switch	H. BLK SW.
S 2	" -001	"	V. BLK SW.
S 3	SCV0403-001	"	SPLIT–FULL
S 4	SCV0389-001	"	INT. SC COARSE
S 5	SCV0370-001	"	EXT SC COARSE
S 6	SCV0403-001	"	I SW.
S 7	" -001	"	Q SW.
CN 5	SCV0501-001	30-P Connector	

8.2.6 AT Board Ass'y .... Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	SCV0475-001	Function Module (H)	JVC
IC 2	" -001	"	"
IC 3	" -001	"	"
IC 4	TC4053BF	IC (M)	TOSHIBA
IC 5	SCV0472-001	Function Module (H)	JVC
IC 6	SCV0476-001	"	"
IC 7	" -001	"	"
IC 8	" -001	"	"
IC 9	" -001	"	"
IC10	NJM4558M	IC (M)	JRC
IC11	"	"	"
IC12	SCV0323-002	Function Module (H)	JVC
IC13	" -002	"	"
IC14	–	–	
IC15	NJM2904M	IC (M)	JRC
IC16	"	"	"
IC17	NJM4558M	"	"
IC18	LM1414N	"	MATSUSHITA
IC19	"	"	"
IC20	TC4066BF	"	TOSHIBA
IC21	TC4071BF	"	"
IC22	"	"	"
Q 1	DTC124K	Transistor	ROHM
Q 2	2SB710(Q)	"	MATSUSHITA
Q 3	DTC124K	"	ROHM
Q 4	"	"	"
Q 5	–	–	
Q 6	–	–	
Q 7	2SC2295(B)	Transistor	MATSUSHITA
Q 8	"	"	"
Q 9	"	"	"
Q10	"	"	"
Q11	"	"	"
Q12	"	"	"
Q13	"	"	"
Q14	"	"	"
Q15	2SK198(Q)	FET	"
Q16	"	"	"
Q17	2SC2295(B)	Transistor	"
D 1	MA152A	Si Diode	MATSUSHITA
D 2	–	–	
D 3	MA152A	Si Diode	MATSUSHITA
D 4	"	"	"
D 5	MA152WK	"	"
D 6	"	"	"
D 7	"	"	"
D 8	MA152 WA	"	"
D 9	–	–	
D10	MA152A	Si Diode	MATSUSHITA
D11	MA152WK	"	"
D12	MA152WA	"	"

Symbol No.	Part No.	Part Name	Description
R 1	SCV0492-502	VR	5 K B AW
R 2	'' -202	''	2K B AB
R14	SCV0492-202	VR	2K R AB
R18	SCV0492-502	VR	5 K R AW
R20	SCV0600-202	VR	2K B-V SHIFT
R21	'' -202	''	2K B-H SHIFT
R22	'' -202	''	2K R-V SHIFT
R23	'' -202	''	2K R-H SHIFT
C 1	QEJ41VM-105	T Cap	1 35 V
C 2	'' -105	''	1 ''
C 3	'' -105	''	1 ''
C 4	QER41AM-476	E Cap	47 10 V
C 5	'' -476	''	47 ''
C 6	'' -476	''	47 ''
C 7	QEJ40JM-476	T Cap	47 6.3 V
C 8	QCY81HK-103	C Cap	0.01 50 V K
C 9	QER41EM-106	E Cap	10 25 V
C10	'' -106	''	10 ''
C11	'' -106	''	10 ''
C12	'' -106	''	10 ''
C13	'' -106	''	10 ''
C14	'' -106	''	10 ''
C15	'' -106	''	10 ''
C16	'' -106	''	10 ''
C17	'' -106	''	10 ''
C18	'' -106	''	10 ''
C19	QCY81HK-103	C Cap	0.01 50 V K
C20	'' -103	''	0.01 '' ''
C21	'' -103	''	0.01 '' ''
C22	QCF81HZ-104	''	0.1 ''
C23	'' -104	''	0.1 ''
C24	QCY81HK-333	''	0.033 '' K
C25	QCF81HZ-104	''	0.1 ''
C26	QEJ41AM-226	T Cap	22 10 V
C27	QEJ41VM-105	''	1 35 V
C28	QEJ41AM-226	''	22 10 V
C29	QER41EM-106	E Cap	10 25 V
C30	QCS81HJ-270	C Cap	27 P 50 V J
C31	'' -470	''	47 P '' ''
C32	QER41EM-106	E Cap	10 25 V
C33	QER40JM-476	''	47 6.3 V
C34	QCF81HZ-104	C Cap	0.1 50 V
C35	'' -104	''	0.1 ''
C36	'' -104	''	0.1 ''
C37	QER41EM-106	E Cap	10 25 V
C38	QCF81HZ-104	C Cap	0.1 50 V
C39	QCS81HJ-121	''	120 P '' J
C40	QER40JM-476	E Cap	47 6.3 V
C41	QER41EM-106	''	10 25 V
C42	QEJ41AM-226	T Cap	22 10 V
C43	QER41AM-476	E Cap	47 10 V
C44	QCS81HJ-101	C Cap	100 P 50 V J
C45	QER41EM-106	E Cap	10 25 V

Symbol No.	Part No.	Part Name	Description
C46	QER41EM-106	E Cap	10 25 V
C47	QEJ41AM-226	T Cap	22 10 V
C48	'' -106	''	10 ''
C49	'' -106	''	10 ''
C50	QCF81HZ-104	C Cap	0.1 50 V
C51	QER41HM-475	E Cap	4.7 ''
C52	'' -476	''	4.7 ''
C53	QER41EM-106	''	10 25 V
L 1	SCV0331-221	Peaking Coil	220 μH
L 2	PU48530-181	''	180 μH
L 3	SCV0331-820	''	82 μH
S 1	SCV0490-001	Slide Switch	AUTO BLK.
CN 4	SCV0501-001	Connector	30 pin
	SCV0494-012	''	
	SCV0495-012	''	
	SCV0636-011	Battery	

[AT-2 BOARD]

IC24	SCV0323-002	Function Module (H)	JVC
IC25	'' -002	''	''
IC26	NJM2904M	IC (M)	JRC
IC27	''	''	''
IC28	TC4071BF	''	TOSHIBA
IC29	TC4520BF	''	''
IC30	''	''	''
Q21	DTC124K	Transistor	ROHM
Q22	''	''	''
D15	MA152WA	Si Diode	MATSUSHITA
D16	''	''	''
D17	MA152A	''	''
D18	''	''	''
C56	QCF41HZ-104	C Cap	0.1 50 V
C57	QEE41AM-475	T Cap	4.7 10 V
	SCV0494-012	Connector	12-pin
	SCV0495-012	''	''

8.2.7 PS Board Ass'y . . . . Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	CA3130E	IC (M)	RCA
Q 1	2SC2295(B)	Transistor	MATSU SHITA
Q 2	"	"	"
Q 3	2SA1022(B)	"	"
Q 4	2SA777(R)	"	"
Q 5	2SD763-01	"	"
Q 6	2SD814A(Q)	"	"
Q 7	2SC780AG(Y)	"	"
Q 8	"	"	"
Q 9	2SC2295(B)	"	"
Q10	"	"	"
Q11	"	"	"
Q12	"	"	"
Q13	2SA1022(B)	"	"
Q14	2SB792(R)	"	"
Q15	"	"	"
Q16	2SA1022(B)	"	"
Q17	2SB792(R)	"	"
Q18	"	"	"
Q19	2SA1022(B)	"	"
Q20	2SB792(R)	"	"
Q21	"	"	"
Q22	2SA777(R)	"	"
D 1	MA152WK	Si Diode	MATSUSHITA
D 2	RH1S	"	
D 3	1S2076A	"	
D 4	OA91	"	
D 5	1S2076A	"	
D 6	HZ7C2L	Z Diode	7 V HITACHI
D 7	"	"	7 V "
D 8	"	"	7 V "
D 9	HZ6C1L	"	6 V "
R18	SCV0491-203	VR	20K T.BL
R20	SCV0492-504	VR	500K R FOCUS
R21	" -504	"	500K G FOCUS
R22	" -504	"	500K B FOCUS
R37	SCV0491-502	VR	5K B ABC
R39	SCV0491-504	VR	500K B BEAM SET
R41	SCV0491-204	VR	100K B BEAM CLIP
R43	SCV0491-502	VR	5K G ABC
R45	SCV0491-504	VR	500K G BEAM SET
R47	SCV0491-204	VR	200K G BEAM CLIP
R49	SCV0491-502	VR	5K R ABC
R67	SCV0491-504	VR	500K R BEAM SET
R69	SCV0491-204	VR	200K R BEAM CLIP

Symbol No.	Part No.	Part Name	Description
C 1	QCF81HZ-104	C Cap	0.047 50 V
C 2	QER41HM-475	E Cap	4.7 "
C 3	QER41AM-476	"	47 10 V
C 4	QCS81HJ-221	C Cap	220 P 50 V J
C 5	QER41HM-105	E Cap	1 "
C 6	QEJ41AM-476	T Cap	47 10 V
C 7	QETC1AM-227	E Cap	220 "
C 8	QFM42DK-123	PP Cap	0.012 200 V
C 9	SCV0385-223	"	0.022 1 kV
⚠C10	QFH42JM-223	"	0.022 630 V
⚠C11	SCV0058-104	"	0.1 400 V
⚠C12	SCV0181-104	"	0.1 250 V
C13	QET42CR-105	E Cap	1 160 V
⚠C14	SCV0181-104	PP Cap	0.1 250 V
⚠C15	" -104	"	0.1 "
⚠C16	" -104	"	0.1 "
C17	QER41EM-106	E Cap	10 25 V
C18	QER40JM-476	"	47 6.3 V
C19	QETC2AM-105	"	1 100 V
C20	" -105	"	1 100 V
C21	" -105	"	1 100 V
C22	" -105	"	1 100 V
C23	QCS81HJ-102	C Cap	1000 P 50 V J
C24	QCS81HJ-101	"	100 P " J
C25	QER41EM-106	E Cap	10 10 V
C26	QER40JM-476	"	47 6.3 V
C27	QEJ41AM-226	T Cap	22 10 V
C28	QCS81HJ-391	C Cap	390 P 50 V J
C29	QET42CR-105	E Cap	1 160 V
C30	QCS81HJ-391	C Cap	390 P 50 V J
C31	QET42CR-105	E Cap	1 160 V
C32	QCS81HJ-391	C Cap	390 P 50 V J
C33	QET42CR-105	E Cap	1 160 V
C34	QEJ41AM-226	T Cap	22 10 V
C35	QETC1AM-227	E Cap	220 "
C36	" -227	"	220 "
C37	QER41AM-476	"	47 "
C38	" -476	"	47 "
L 1	SA40318-00A	Choke Coil	
⚠T 1	SCV0488-001	F.B. Trans.	
⚠CN 1	SCV0501-001	Connector	30-pin

8.2.8 CT Board Ass'y .... Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	TC4053BF	IC (M)	TOSHIBA
IC 2	AN6913	"	MATSUSHITA
IC 3	TA78L009AP	"	9 V TOSHIBA
IC 4	–	–	
IC 5	SCV0478-001	Function Module (H)	JVC
IC 6	SCV0236-001	"	"
IC 7	SCV0473-001	"	"
IC 8	μPC592H	IC (M)	NEC
IC 9	SCV0689-011	Function Module (H)	JVC
Q 1	2SA1022(B)	Transistor	MATSUSHITA
Q 2	2SC2295(B)	"	"
Q 3	–	–	
Q 4	2SC2295(B)	Transistor	MATSUSHITA
Q 5	"	"	"
Q 6	"	"	"
Q 7	2SA1022(B)	"	"
Q 8	2SC2295(B)	"	"
Q 9	"	"	"
Q10	"	"	"
Q11	–	–	
Q12	2SC2295(B)	Transistor	MATSUSHITA
D 1	HZ5B1	Z. Diode	5 V HITACHI
D 2	MA152WK	Si Diode	MATSUSHITA
D 3	MA152A	"	"
D 4	"	"	"
R13	SCV0379-503	VR	50K M BLK
C 1	QER41EM-106	E Cap	10 10 V
C 2	QER41EM-106	"	10 25 V
C 3	–	–	
C 4	QCY81HK-103	C Cap	0.01 50 V K
C 5	QER41AM-476	E Cap	47 10 V
C 6	QER41EM-106	"	10 25 V
C 7	QER40JM-476	"	10 35 V
C 8	QER41AM-476	"	47 10 V
C 9	QEPC1CM-106	"	10 16 V
C10	QCF81HZ-104	C Cap	0.01 50 V
C11	" -104	"	0.01 "
C12	QER41EM-106	E Cap	10 25 V
C13	QCS41HJ-3R0	C Cap	3 P 50 V J
C14	QEJ41AM-106	T Cap	10 10 V
C15	QER41AM-476	E Cap	47 "
C16	QER40JM-476	"	47 6.3 V
C17	QER40JM-476	"	47 35 V
C18	QETC1AM-227	"	220 10 V

Symbol No.	Part No.	Part Name	Description
C19	QER41HM-105	E Cap	4.7 50 V
C20	QCF81HZ-104	C Cap	0.01 "
C21	QER41EM-106	E Cap	10 25 V
C22	QCY81HK-682	C Cap	0.0068 50 V K
C23	QER41HM-105	E Cap	1 "
C24	QCS81HJ-121	C Cap	120 P " J
C25	QER41EM-106	E Cap	10 25 V
C26	QER41AM-476	"	47 10 V
C27	" -476	"	47 "
C28	QER41EM-106	"	10 25 V
C29	QCY81HK-103	C Cap	0.1 50 V K
S 1	SCV0493-043	Slide Switch	VF SELECT SW
S 2	" -043	"	"
S 3	SCV0497-342	"	MIC LEVEL
S 4	SCV0493-042	"	VTR L/B
⚠ CN13	SCV0440-012	Connector	12-pin
⚠ CN14	SCV0441-008	"	8-pin
⚠ CN15	SCV0440-005	"	5-pin
⚠ CN16	" -003	"	3-pin
⚠ CN42	SCV0440-002	Connector	2-pin
⚠ CN43	" -002	"	"

8.2.9 RC Board Ass'y .... Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	TA78L008AP	IC (M)	TOSHIBA
IC 2	CA3130E	″	RCA
IC 3	SCV0473-001	Function Module (H)	JVC
Q 1	2SB856(C)	Transistor	MATSUSHITA
Q 2	2SC1384(R)	″	″
Q 3	2SC2295(B)	″	″
Q 4	″	″	″
Q 5	2SC2406(S)	″	″
Q 6	2SA1022(B)	″	″
Q 7	2SC2406(S)	″	″
Q 8	2SA1022(B)	″	″
Q 9	2SC2406(S)	″	″
Q10	2SA1022(B)	″	″
Q11	2SC1384(R)	″	″
R 7	SCV0491-102	VR	1K +9 V ADJ
R11	SCV0600-203	VR	20K ZEBRA SET
C 1	QER41EM-106	E Cap	10 25 V
C 2	″ -106	″	10 ″
C 3	QER41HM-475	″	4.7 50 V
C 4	QCS81HJ-470	C Cap	47 P ″ J
C 5	QCF81HZ-104	″	0.1 ″
C 6	QETC1AM-227	E Cap	220 10 V
C 7	″ -227	″	220 ″
C 8	QCF81HZ-104	C Cap	0.1 50 V
C 9	–	″	68 P ″
C10	QER41AM-476	E Cap	47 10 V
C11	QETC1AM-227	″	220
C12	QER41HM-475	″	4.7 50 V
C13	QEJ41AM-226	T Cap	22 10 V
C14	″ -106	″	10 ″
C15	QER41AM-476	E Cap	47 ″
C16	QCF81HZ-104	C Cap	0.1 50 V
C17	QETC1AM-227	E Cap	220 10 V
⚠ CN20	SCV0441-002	Connector	2-pin
⚠ CN21	SS30662-003	″	
⚠ CN22	″ -003	″	
⚠ CN23	″ -003	″	
⚠ CN29	SCV0525-001	Connector	40-pin
⚠ CN30	SS31053-020	″	20-pin
⚠ CN40	SS30662-003	Connector	
⚠ CN45	SCV0441-002	Connector	2-pin

8.2.10 SW Board Ass'y .... Not Available

Symbol No.	Part No.	Part Name	Description
C 1	QCF81HZ-104	C Cap	0.1 50 V
C 2	″ -104	″	0.1 ″
S 1	SCV0516-A13HB2	Toggle Switch	HI SENS
S 2	SCV0339-002	″	WHITE BAL.
S 3	SCV0337-002	″	IRIS
S 4	SCV0516-A18JB2	″	AW/AB
S 5	SCV0469-001	Push Switch	LEVEL IND.
S 6	SCV0516-A22JH	Toggle Switch	BARS
S 7	″ -A2SJH	″	AUTO SHIFT
S 8	SCV0469-001	Push Switch	VTR TRIG.
	SLB-26UR50-154	LED	

8.2.11 MT-1 Board Ass'y .... Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	SCV0484-001	Function Module (H)	JVC
IC 2	TC40H000F	IC (M)	TOSHIBA
IC 3	TC4053BF	"	"
IC 4	"	"	"
IC 5	SCV0471-001	Function Module (H)	JVC
IC 6	" -011	"	"
IC 7	NJM4556M	IC (M)	JRC
IC 8	"	"	"
IC 9	SCV0473-011	Function Module (H)	JVC
Q 1	2SA1022(B)	Transistor	MATSUSHITA
Q 2	2SC2295(B)	"	"
Q 3	DTC124K	"	ROHM
Q 4	2SA1022(B)	"	MATSUSHITA
Q 5	2SC2295(B)	"	"
Q 6	2SA1022(B)	"	"
Q 7	"	"	"
Q 8	"	"	"
Q 9	2SC2295(B)	"	"
Q10	2SA1022(B)	"	"
Q11	2SC2406(S)	"	"
Q12	2SA1022(B)	"	"
Q13	2SC2295(B)	"	"
Q14	"	"	"
Q15	2SA1022(B)	"	"
Q16	"	"	"
Q17	DTC124K	"	ROHM
D 1	MA152WK	Si Diode	MATSUSHITA
D 2	MA152A	"	"
D 3	MA152WK	"	"
D 4	MA152A	"	"
D 5	"	"	"
D 6	MA152A	"	"
D 7	"	"	"
D 8	"	"	"
D 9	"	"	"
D10	"	"	"
C 1	QFH42JM-223	P Cap	0.022 630 V
C 2	" -223	"	0.022 "
C 3	" -223	"	0.022 "
C 4	QCF81HZ-104	C Cap	0.1 50 V
C 5	QER40JM-107	E Cap	100 6.3 V
C 6	QER41HM-475	"	4.7 50 V
C 7	" -475	"	4.7 "
C 8	" -475	"	4.7 "
C 9	" -105	"	1 "
C10	QCY81HK-272	C Cap	0.0027 " K
C11	QCS81HJ-561	"	560 P
C12	QER41AM-476	E Cap	47 10 V
C13	QER41HM-105	"	1 50 V
C14	QER41AM-106	T Cap	10 10 V
C15	QER41EM-106	E Cap	10 25 V
C16	QEJ41AM-106	T Cap	10 10 V
C17	QER41EM-106	E Cap	10 25 V
C18	QER41HM-105	"	1 50 V
C19	QER40JM-476	"	4.7 6.3 V
C20	QEJ41AM-106	T Cap	10 10 V
C21	QER41EM-106	E Cap	10 25 V
C22	QER41HM-105	"	1 50 V
C23	QETA1AM-227	"	220 10 V
C24	QER41EM-106	"	10 25 V
C25	–	–	
C26	QER41AM-476	E Cap	47 10 V
C27	QETC1AM-227	"	220
C28	QER41CM-476	"	47 16 V
C29	QER40JM-476	"	47 6.3 V
C30	QETA1AM-221	"	220 10 V
C31	QCF81HZ-104	C Cap	0.1 50 V
C32	" -104	"	0.1 "
C33	QEJ41VM-104	T Cap	0.1 35 V
C34	QCS81HJ-330	C Cap	33 P 50 V
⚠ CN 1	SCV0500-001	30-P Connector	
⚠ CN 2	" -001	"	
⚠ CN 3	" -001	"	
⚠ CN 4	" -001	"	
⚠ CN 5	" -001	"	
⚠ CN 6	–	–	
⚠ CN 7	SC30060-005	Flat Cable Ass'y	
⚠ CN 8	–	–	
⚠ CN 9	SS30644-008	Connector	
⚠ CN10	" -008	"	
⚠ CN11	" -008	"	
⚠ CN17	SCV0440-006	Connector	6-pin
⚠ CN18	" -012	"	12-pin
⚠ CN19	" -010	"	10-pin
⚠ CN24	SCV0440-008	Connector	8-pin
⚠ CN30	SS31053-020	Card Fit R.	
⚠ CN43	SCV0440-003	Connector	3 pin
⚠ CN44	SCV0440-002	"	2 pin
⚠ CN46	SCV0441-002	Connector	2 pin

8.2.12 MT-2 Board Ass'y . . . . Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	SCV0489-002	Function Module (H)	JVC
IC 2	" -002	"	"
IC 3	" -002	"	"
IC 4	" -002	"	"
IC 5	" -002	"	"
IC 6	" -002	"	"
Q 1	2SC2295(B)	Transistor	MATSUSHITA
Q 2	"	"	"
D 1	MA152A	Si Diode	MATSUSHITA
R 6	SCV0601-103	VR	10K B-X ALIGN
R 7	" -103	"	10K G-X ALIGN
R 8	" -103	"	10K R-X ALIGN
R 9	SCV0492-103	"	10K B-Y ALIGN
R10	" -103	"	10K G-Y ALIGN
R11	" -103	"	10K R-Y ALIGN
C 1	QCF81HZ-104	C Cap	0.1 50 V
C 2	QER41AM-476	E Cap	47 10 V
C 3	QEJ41AM-106	T Cap	10 "
⚠ CN25	SCV0440-008	Connector	8-pin
⚠ CN26	" -008	"	"
⚠ CN28	SCV0440-002	Connector	2-pin
⚠ CN38	SCV0440-009	Connector	9-pin
⚠ CN41	SS30644-003	Connector	3-pin
⚠ CN46	SCV0440-004	Connector	4-pin
⚠ CN47	" -004	"	"
⚠ CN48	" -004	"	"

8.2.5-P SE Board Ass'y .... Not Available

Symbol No.	Part No.	Part Name	Description
IC 1	SCV0532-001	Function Module (H)	JVC
IC 2	AN614	Integrated Circuit (M)	MATSUSHITA
IC 3	"	"	"
IC 4	SCV0533-001	Function Module (H)	JVC
IC 5	TC40H193F	Integrated Circuit (M)	TOSHIBA
IC 6	SCV0486-001	Function Module (H)	JVC
IC 7	SCV0322-002	" (M)	"
IC 8	SN74LS93	Integrated Circuit (M)	
IC 9	NJM4560M	" (M)	
IC10	TC4053BF	" (M)	
IC11	SCV0498-001	Function Module (H)	
IC12	SCV0355-001	" (H)	
IC13	SCV0564-001	" (H)	
IC14	AN614	Integrated Circuit (M)	
IC15	SCV0499-001	Function Module (H)	
IC16	AN614	Integrated Circuit (M)	
IC17	TC50H000P	" (M)	
IC18	TC4053BF	" (M)	
IC19	TC40H008F	" (M)	
IC20	TC40H000F	" (M)	
IC21	TC40H004F	" (M)	
IC22	"	" (M)	
IC23	TC4053BF	" (M)	
Q 1	2SC2295(B)	Si. Transistor	
Q 2	"	"	
Q 3	"	"	
Q 4	2SJ84(Q)	"	
Q 5	2SC2295(B)	"	
Q 6	"	"	
Q 7	2SA777(R)	"	
Q 8	2SC2295(B)	"	
Q 9	"	"	
Q10	"	"	
Q11	2SA1022(B)	"	
Q12	"	"	
Q13	2SK198(Q)	FET	
Q14	2SC2295(B)	Si Transistor	
Q15	"	"	
Q16	2SA1022(B)	"	
Q17	"	"	
Q18	2SD602(Q)	"	
Q19	2SC2295(B)	"	
Q20	"	"	
Q21	2SK198(Q)	FET	
Q22	2SC2295(B)	Si Transistor	
Q23	"	"	
Q24	"	"	
Q25	2SA1022(B)	"	
Q26	2SC2295(B)	"	
Q27	2SA1022(B)	"	
Q28	2SC2295(B)	"	
Q29	2SA1022(B)	"	
Q30	2SC2295(B)	"	
Q31	2SJ84	FET	
Q32	2SC2295(B)	Si. Transistor	
Q33	"	"	
Q34	2SK198(Q)	FET	
Q35	2SC2295(B)	Si. Transistor	
Q36	2SA1022(B)	Si. Transistor	
Q37	2SC2295(B)	"	
Q38	"	"	
Q39	2SK198(Q)	F.E.T	
Q40	2SC2295(B)	Si. Transistor	
Q41	2SA1022(B)	"	
Q42	2SC2295(B)	"	
Q43	"	"	
D 1	MA152A	Si. Diode	
D 2	"	"	
D 3	"	"	
D 4	SVC321(A)	"	
D 5	"	"	
D 6	MA152A	"	
D 7	1S2076A	"	
D 8	"	"	
D 9	"	"	
D10	MA152A	"	
D11	"	"	
D12	"	"	
R17	SCV0380-202	VR	2 K SC FINE
R33	SCV0380-303	VR	30 K H. PHASE
R51	SCV0600-102	VR	1 K SC LOCK
R102	SCV0600-202	VR	2 K Y GAIN
R109	SCV0601-502	VR	5 K SYNC LEVEL
R128	SCV0600-501	VR	500 QUAD PHASE
R135	SCV0600-201	VR	200 W BAL. 1
R151	SCV0600-201	VR	200 W. BAL. 2
R159	SCV0600-102	VR	1 K U GAIN
R162	SCV0600-103	VR	10 K BURST LEVEL
R172	SCV0601-102	VR	1 K C. BAL
R173	" -102	"	1 K C. BAL
R174	SCV0600-102	"	1 K C. BAL
R178	SCV0600-103	VR	10 K BURST START
R179	" -103	"	10 K BURST STOP
R181	SCV0600-502	VR	5 K BURST PHASE
R188	SCV0601-501	VR	500 CHROMA GAIN

Symbol No.	Part No.	Part Name	Description	
C 1	QEE41AM-106	T Cap	10	10 V
C 2	QCY81HK-103	C Cap	0.01	50 V
C 3	QCT41CH-220	"	22 P	16 V
C 4	QCY81HK-103	"	0.01	50 V
C 5	QCT81CH-101	"	100 P	16 V
C 6	QCY81HK-103	"	0.01	50 V
C 7	QCT81CH-101	"	100 P	16 V
C 8	QEE41AM-226	T. Cap	22	10 V
C 9	QCY81HK-103	"	0.01	"
C10	QCT41CH-560	"	56 P	16 V
C11	QCF81HZ-104	C Cap	0.1	50 V
C12	QCS81HJ-221	"	220 P	50 V
C13	QCY81HK-103	"	0.01	50 V
C14	" -103	"	0.01	"
C15	QCT81CH-101	"	100 P	16 V
C16	QCY81HK-103	"	0.01	50 V
C17	QEE41VM-105	E Cap	1	35 V
C18	–	–		
C19	QCF81HZ-103	C Cap	0.01	50 V
C20	QCT81CH-151	"	150 P	16 V
C21	QCF81HZ-104	"	0.1	50 V
C22	QETA1AM-227	E Cap	220	10 V
C23	QER41AM-476	"	47	"
C24	QCT81CH-101	C Cap	100 P	16 V
C25	QCY81HK-333	"	0.033	50 V
C26	QEE41AM-475	T Cap	4.7	10 V
C27	QEE41AM-106	"	10	10 V
C28	QCS81HJ-561	C Cap	560 P	50 V
C29	QEE41AM-475	T Cap	4.7	10 V
C30	–	–		
C31	–	–		
C32	–	–		
C33	–	–		
C34	–	–		
C35	–	–		
C36	–	–		
C37	–	–		
C38	–	–		
C39	–	–		
C40	–	–		
C41	–	–		
C42	–	–		
C43	–	–		
C44	–	–		
C45	–	–		
C46	–	–		
C47	QER41AM-476	E Cap	47	10 V
C48	–	–		
C49	–	–		
C50	QEE41AM-106	T Cap	10	10 V
C51	QCY41HK-103	C Cap	0.01	50 V
C52	QEE41AM-106	T Cap	10	10 V
C53	" -106	"	10	"
C54	QEJ61AM-106	"	10	"
C55	QETA1AM-227	"	220	10 V
C56	QCT81CT-560	C Cap	56 P	16 V
C57	QAT3001-011	TR Cap	SC FREQ	
C58	QCT05UJ-100	C Cap	10 P	
C59	QCS81HJ-470	"	47 P	50 V
C60	QAT3001-011	TR Cap	282 fh ADJ.	
C61	QCT05CH-151	C Cap	150 P	
C62	QCF81HZ-104	"	0.1	50 V
C63	" -104	"	0.1	"
C64	QER41AM-476	E Cap	47	10 V
C65	QEE41AM-106	T Cap	10	"
C66	QEE41AM-106	T Cap	10	10 V
C67	QCS81HJ-330	"	33 P	50 V
C68	QCY81HK-103	"	0.01	"
C69	QER40JM-476	E Cap	47	6.3 V
C70	QEE40JM-476	T Cap	47	"
C71	QCY81HK-103	C Cap	0.01	50 V
C72	" -103	"	0.01	"
C73	QER40JM-476	E Cap	47	6.3 V
C74	QCT81CH-101	C Cap	100 P	16 V
C75	QCY81HZ-104	"	0.1	50 V
C76	" -102	"	0.1	"
C77	QCF81HZ-104	"	0.1	"
C78	QCS81HJ-120	"	12 P	"
C79	" -150	"	15 P	"
C80	–	–		
C81	–	–		
C82	–	–		
C83	QEJ41EM-106	E Cap	10	25 V
C84	QEE41AM-106	T Cap	10	10 V
C85	QER41EM-106	E Cap	10	25 V
C86	QCS81HJ-560	C Cap	33	50 V
C87	QER41AM-476	E Cap	47	10 V
C88	QER41EM-105	"	10	25 V
C89	QCS81HJ-6R0	"	4 P	50 V
C90	QCS81HJ-101	C Cap	100 P	"
C91	QER40JM-476	E Cap	47	6.3 V
C92	QCT81CH-121	C Cap	120 P	16 V
C93	QCY81HK-103	"	0.01	50 V
C94	QCT81CH-121	"	12 P	16 V
C95	" -560	"	56 P	"
C96	QEJ41VM-105	T Cap	1	35 V
C97	QCY81HK-103	C Cap	0.01	50 V
C98	QCF81HZ-104	"	0.01	"
C99	" -104	"	0.01	"
C100	–	–		
C101	QCF81HZ-104	"	120 P	16 V
C102	" -560	"	56 P	"
C103	QCF81HZ-104	C Cap	0.1	50 V
C104	QEE41VM-105	T Cap	1	35 V
C105	QCY81HK-103	C Cap	0.01	50 V
C106	QCF81HZ-104	"	0.01	"
C107	QCY81HK-103	"	0.01	"
C108	QER41EM-106	E Cap	10	25 V
C109	QCT81CH-220	"	22 P	16 V
C110	" -120	C Cap	10	"
C111	QCF81HZ-104	"	10	"
C112	QCT81CH-180	"	18 P	"
C113	" -330	"	33 P	"
C114	" -390	"	39 P	"
C115	QCY81HK-103	"	0.01	50 V
C116	QCF81HZ-330	"	33	"
C117	QER60JM-107	E Cap	10	6.3 V
C118	QCF81HZ-104	C Cap	0.1	50 V
C121	QCF81HZ-104	C Cap	0.1	50 V
C122	QEE41AM-106	T Cap	10	10 V
C130	QCS81HJ-7R0	C Cap	7 P	50 V
C230	" -7R0	"	7 P	"
C330	" -7R0	"	7 P	"
C122	QCY81HK-103	C Cap	0.01	50 V
C123	QCS81HJ-680	"	68 P	"

Symbol No.	Part No.	Part Name	Description
L 1	SCV0331-820	Peaking Coil	
L 2	" -120	"	
L 3	" -120	" "	
L 4	" -220	"	
L 5	SCV0100-001	Osc. Coil	
L 6	SCV0331-270	Peaking Coil	
L 7	" -121	"	
L 8	" -220	"	
L 9	" -390	"	
L10	" -110	"	
L12	SA40318-00A	C. Coil	
X 1	SCV0348-002	Crystal	17 MHz
X 2	SCV0349-002	"	4.40625 MHz
DL 1	SCV0574-001	D. Line	
T 1	SCV0171-001	SC Trans.	
T 2	" -001	"	
S 1	SCV0370-001	Slide Switch	SC PHASE COARSE
S 2	—	—	
S 3	SCV0389-001	Slide Switch	H. BLK. WIDTH
S 4	" -001	"	V. BLK. WIDTH
S 5	SCV0403-001	"	V. SWITCH
S 6	" -001	"	U. SWITCH
CN 5	SCV0501-001	30-P Connector	